

Railway Age

Vol. 64.

April 19, 1918

No. 16



American Troops Arriving at the Front

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EDITORIAL

Railway Age

Power! Power!—More Power!

WE NEED POWER to win the war. Make existing power do more work.

Make it work longer hours.

Shop facilities must be improved so that the power may be promptly repaired.

Engine terminals must be improved so that the power may be promptly turned.

Existing power must be improved so that it will do more work at less cost and with less physical demands on the engine crew.

Be sure the power is carrying its full load.

Improve the utilization of the power by better despatching.

Locomotives must be ordered *now* for next winter! Further delay will be dangerous.

The two principal arguments put forth by the Railroad Administration for standard locomotives are *tremendous* increase in locomotive production and a liquid reserve of power. We have it on good authority that *no* increase in production of locomotives can be expected this year if standard locomotives are adopted and that *perhaps* next year it may be possible to increase the output 10 per cent. There is every possibility of a *decrease* in locomotive production this year if orders for new locomotives are not placed immediately, and *now* is the time we need locomotives. By building locomotives to existing designs and by bringing the same pressure to bear on their production as would be brought to bear on the standard locomotives, the output of locomotives this year will be *increased*. The 10 per cent increase in locomotive production next year is open to question, as we are informed that a large part of the builders' manufacturing capacity will be taken up in making repair parts, with their new jigs, patterns and templates, for the roads on which the standard locomotives are to be used. We are also told the builders will have to provide space for repairing locomotives due to the lack of railway shop facilities! By building locomotives to existing designs and permitting the roads to supply their own repair parts, the builders' plants can concentrate on building new locomotives. The 10 per cent increase in production is, therefore, open to question, but the largest question is, will any increase justify the increased burden which will be placed on the railroads in maintaining and operating these standard locomotives. A liquid reserve of power has its advantages. Some 600 locomotives have been interchanged between roads, including the U. S. A. and Russian engines. Why?—Because the railways have found it impossible properly to maintain their own power. At no time, particularly if the roads had their power in shape, should there be a very great demand for such locomotives. Would it, therefore, not be more logical to build only that number which would answer the purpose of a liquid reserve, rather

Arguments for Standard Locomotives?

than ask every railroad to operate locomotives of a design which is foreign to its line and which will complicate both the repair and operating problems? Increased production of locomotives and liquid reserve of power are not the only things to be considered in standardizing locomotives.

A practice which the railroads can justly be criticised for following in the past is the purchasing of large and heavy locomotives without providing proper facilities for housing and maintaining them. A few years ago the president of an eastern road consulted the officer in charge of the mechanical department

The Cart Before the Horse

on the matter of purchasing some of this heavy power, calling attention to the fact that one of the neighboring roads, which, by the way, had shop facilities far inferior to those on his own road, was purchasing such equipment. The mechanical department officer argued strongly against such a program until the road's shop facilities were improved to maintain the larger power. His advice was followed. Today the president, watching the results of the heavy power on the other road, has become fully convinced that the decision was wise. The poorly equipped road with the heavy power is repairing it at a cost twice what it would be had it been provided with proper facilities; indeed it is having some of the work done by outside plants equipped to handle repairs to heavy locomotives. Is the Railroad Administration going to make the same mistake? It is of vital importance that provision be made for maintaining new and additional power before it is received. Let us not put the cart before the horse.

The facilities for repairing and maintaining locomotives must be improved immediately. It is of the greatest importance that the improvement work be started at once in order that the railways will be in shape to handle the necessary repairs to equipment next winter. Every railroad mechanical man in the country will agree that his shop facilities are not adequate. The Erie and the Baltimore & Ohio, for instance, have found it necessary to send some of their locomotives to the locomotive builders to be repaired because their facilities are inadequate. This not only takes up valuable space of the locomotive builders' plants which should properly be used in building new locomotives, but it also increases the cost of repairs some two or three times, as the builders cannot repair power as economically as the owning roads. With the new and heavier locomotives that will be introduced this year the repair problems will become more serious. Much has been done already to increase the output of locomotive repair shops by working longer hours. Reports from 101 of the principal railroads of the country show that during February, 1918, the shop output was 8,390 as compared with 6,824 during the same month of 1917, an increase of 1,566. While this figure does not represent accurately the increase in production because of the classifications used in the different shops, it does represent the actual increase in locomotives which were repaired and put into service during that time. The return on the investment in improved shop and round-

Shop Facilities of Paramount Importance

house facilities will be much greater now than ever before. The engine terminals particularly are sadly in need of improvement. Lack of facilities here was responsible to a very large extent for the condition of the motive power last winter. Let everyone concentrate on providing facilities properly to maintain the power. It is far more important to the railways at this time than the development of standard locomotives.

For the past week the Fuel Administration has been renewing its complaints that coal production is being retarded by the shortage of the car supply. No one can deny the fact but the way in which the Fuel Administration handles the facts seems calculated for the purpose of placing the blame on some one else rather than as an effort to explain what the true situation is. The Railroad Administration apparently has refrained from engaging in a controversy on the subject, but on Monday of this week, after Dr. Garfield had issued a statement based on a sharp reduction during the first week in April, it issued figures showing the number of cars of coal of all kinds loaded since the first of the year, which indicate a rather creditable performance in overcoming the handicap of the unprecedented weather of January. During the week ending April 6, according to the Geological Survey preliminary figures, there was a reduction of 14 per cent in the production of bituminous coal as compared with the previous week. This was attributed in the report largely to the holiday on April 1. Dr. Garfield attributes it largely to shortage of transportation. The report shows that with the exception of that week coal production had been above last year's average since the middle of February and the Railroad Administration's figures show that although there was a decrease of 79,000 carloads in the volume of coal loaded in January, there was an increase of 31,000 cars in February, of 46,000 cars in March, and of 7,750 cars in the first week of April. There has, therefore, been an increase of 6,441 cars so far this year. While the increase is small, it should count for more than the figures for one week's loss to which Dr. Garfield calls public attention.

No organization has been more emphatic in its expressions of loyalty to the government in the prosecution of the war than

Chamber of Commerce on Railroads

the Chamber of Commerce of the United States, which held its sixth annual meeting at Chicago last week. No class of men recognize more keenly the necessity for unified support of the administration in whatever policy it pursues than the business men of the country. Nevertheless, the transportation problem is such a vital one at this time and so far-reaching in its effects on the life of all interests in the nation that the business world has come to recognize it as a question intimately connected with its affairs and one demanding its closest attention and study. It was therefore not in the spirit of criticism but in the hope of offering helpful suggestions to the Railroad Administration in meeting the complex difficulties confronting it that the Chamber of Commerce of the United States passed certain resolutions voicing the sentiment of the organization on the railroad problem as it exists at the present time. The resolutions point out that railroad equipment is inadequate for present traffic and threatens to become so insufficient during the coming autumn and winter as seriously to restrict the industries and trade of the country. While standardization of cars and locomotives is recognized as important and meriting careful consideration, the Chamber urges the imperative necessity of placing orders for equipment at the earliest possible moment so that the increasing

traffic resulting from war demands may be handled expeditiously and without hindrance to the steady flow of supplies to seaboard for shipment to Europe. In questioning the advisability of further delay to locomotive and car manufacture through standardization, the Chamber has courageously struck at the crux of a problem which is weighing heavily upon the minds of both railroad officers and railway supply manufacturers at the present time. Its recommendations should and will, no doubt, gain the attention of the director general of railroads.

A meeting of various representatives of short line railroads was held with John Barton Payne at Baltimore on April 11.

Hard on the Short Lines

Mr. Payne, as the general counsel to the director general of railroads, discussed with the representatives of the short lines some of the problems that are involved under the bill as finally passed, providing for the government taking over the railroads. When the bill was under discussion, Director General McAdoo made it plain that his intention was to take over only such short line railroads as would prove necessary or profitable to the government. Congress then amended section 14 with the evident intention of providing that the government must take over the short lines as well as the larger roads. It would appear, however, from the somewhat general and rather indefinite statements of Mr. Payne, that the government believes that under the clause which provides that it can give up roads which it does not need if action is taken before July 1, in practice the government can avoid being burdened with the short lines. Under private management the short lines were able to drive a fair bargain with the larger roads with which they connected for a division of rates by threatening to divert traffic or to appeal to the Interstate Commerce Commission. With the government in control of the large roads, neither of these alternatives would be available. Quite a number of the short lines are now unprofitable and, if the present comparatively fair division of rates were to be abandoned, as Mr. Payne implied would probably be the case, many more would be unprofitable. Is the government going to prevent the owners of these roads from tearing them up and selling them as junk? To refuse to support them and yet to refuse to permit their abandonment would seem less than just. This is the question which ought to be decided at once. It would appear only fair that the government make some equitable arrangement with the short lines in accordance with the spirit of the amended section 14, or else, if the roads are not necessary to the government, permit their abandonment and sale as junk.

C. A. Greenough, vice-president of the Baldwin Locomotive Works, in a paper on Economy in Maintenance and Operation of Locomotives read before the

Western Railway Club, presents in a diplomatic manner arguments in favor of and against locomotive standardization. The parts of his paper which deal directly with the subject are published elsewhere in this issue. For standardization he says: "Interchangeability between railroads, the possibility of some rapidity of construction, interchangeability of parts, and a somewhat lower cost." His arguments against standardization deal with the inadequacy of the standard locomotives to meet some requirements. He suggests the possibility of "discarded power" being purchased to meet conditions requiring lighter locomotives than those contemplated in the standardization program. He classes as "negative economy" the use of the

heavy government standard locomotives for roads which have been in the past and are now equipped to use heavier locomotives than those considered by the government. He speaks of the radical changes that will be necessary in the construction of the standard locomotives for roads burning anthracite coal. He also mentions the fact that the standard designs have necessarily been cramped to conform to the minimum clearances of all roads. He says standardization ignores the various physical and climatic conditions which exist in this country. He tells of how standardization on the Pennsylvania and the Harriman Lines has not been entirely successful "because growing needs for larger and more efficient power and the improvements in the permanent way have invited and made possible increases in the sizes and capacity of locomotives." The *Railway Age* joins with him in his final statement: "The problem now before the administration is to decide whether or not the criticisms in favor outweigh those against the proposed standardization, and we all await the decision with the keenest interest and we all hope the decision, whatever it may be, will prove for the best." We sincerely hope that as much consideration will be given arguments against standardization as for it. We sincerely hope that the whole problem of standardization will be considered from the broadest angle, and that the decision will be governed by the part the railways are to play in winning the war.

Stand to the Colors!

THE GERMANS, as if by pre-arrangement with the Liberty Loan Committee, are staging today history's most impressive demonstration of the price of liberty. While we at home are being importuned to invest to our individual limits in a third Liberty Loan, the super battle in Flanders is lighting the eastern sky with letters of flame. "Liberty needs every man and every dollar. Stand to your colors now, children of light, or forever lie prostrate in the muck of Prussian dominion."

It is impossible to exaggerate the crisis before us; it is impossible to overestimate the value in such a crisis of huge oversubscription to the Third Liberty Loan. For the purposes of the present battle it will provide an irresistible moral stimulus so vital in that last quarter of an hour in which battles are won. For future battles, possibly even for this one if it lasts as long as some military experts are predicting, it will furnish an abundance of the men and materials without which we must wage war with gestures.

We do not need to go about wringing our hands in apprehension of the doom that threatens in Flanders and Picardy, nor need we permit our anxiety to interfere with food or sleep. A stiff upper lip and a serene attention to the task in hand are the American's duty in the present hour. But at the same time he should face the facts like a man and not like an ostrich. And the facts are grave.

Germany is plunging for the channel ports as she did after Antwerp, only with vastly greater force and a more desperate determination. Could she gain control of these she could so seriously interfere with further British efforts in France as to render them negligible. She might then turn her military steam roller to the business of crushing the unspeakably heroic French army, and from her multiplied bases she might unleash such a cloud of U-boats as would starve the United Kingdom and sever America from Europe.

These are the immediate possibilities of German victory in the present offensive. Like the desperate military gambler he is, the Kaiser is playing for huge stakes. He is pyramiding his bets in men with every reverse. He is committed irrevocably to a triumph on the western front, and

he will not cease to dash his hordes against that barrier of brave men which stands between us and the hideous night of Prussian tyranny until his defeat is too conclusive to permit of further argument.

The United States has its own men in that first line of defense. General Foch, commander-in-chief of the forces of liberty and civilization, has brigaded them with the British and French. The forces of the Allies at the front have been pooled to meet the shock, and now we at home are asked not only to back up our boys in the hell of Picardy and Flanders but to pool our unimpaired resources with the vast accumulation of Allied material built up through more than three years of the kind of pressure which we are experiencing today. We cannot be blind to the urgency; we cannot resist the plea.

"Our hearts, our reason," said Kipling recently to the people of Folkestone, "every instinct in us that lifts us above the mere brute, show us that the war must go on. Otherwise earth becomes a hell without hope. The men, the ships, the munitions must go forward to the war, and behind them must come the money, without which nothing can move. Where our hearts are there must our treasure be also."

The Rising Flood of Railroad Expenses

BEFORE GOVERNMENT CONTROL was adopted the operating expenses of all the railways of the country were increasing at a portentous rate. It was anticipated that this increase would continue, whether private control was continued or government control was adopted.

This anticipation is being fully verified. In January 172 roads had a decrease of \$13,605,871 in operating revenue and an increase of \$54,368,138 in operating expenses, as compared with the same month of last year, resulting in a decrease of \$67,974,009 in net revenue. Both the decrease in earnings and the increase in expenses were largely due to weather conditions, but a large increase in expenses would have been shown if the weather had been normal. In February 117 roads, for which statistics are available, had an increase of \$14,127,521 in operating revenues. This indicates that these roads handled more business than in February, 1917. The weather in February, 1918, was better than it was in the same month of 1917. Nevertheless, in February of this year the operating expenses of these roads were \$31,430,210 more than in the same month of last year, the result being that their net revenue was \$17,302,689 less than last year. In the two months 117 roads had an increase in operating expenses of \$64,300,000.

It is a significant fact that in both months large increases in expenses were shown by the railways in each territory—eastern, southern and western—the result being that in eastern territory the railways failed by large amounts to earn their operating expenses, while in both the south and the west there were heavy reductions of net revenue.

Everybody agrees that the main thing for the railways to do now is to move as much business as possible, and it is gratifying to find that they actually did move more in February, 1918, than in February, 1917. But second only to the moving of the maximum possible business is the importance of keeping down operating expenses. With expenses mounting as they have been, and with large advances of wages impending, it is evident that the Railroad Administration is in danger of being confronted with a huge deficit. The Railroad Administration has ordered various changes which will tend to save money. The most important of these, from the standpoint of economy, is the abolition of the outside traffic agencies, which have been maintained for competitive purposes, and which have cost the railways about \$25,000,000 a year.

But in the face of the rising flood of expenses, such sav-

ings as can be made by eliminating advertising, closing outside agencies, and requiring the companies to pay corporate and financial expenses from their guaranteed compensation will be comparatively negligible.

The really large economies always have been effected in this country by increasing carloads and trainloads. The Railroad Administration can continue to do these things; and it also has the advantages, which the railway managements under private control did not have, of being able to operate terminals jointly and to send traffic over the most direct routes.

For the last twelve years the railway managements have been engaged in an incessant struggle to effect economies which would offset the enormous advances in wages. Within recent years, to continued advances in wages, there have been added great increases in the prices of fuel, equipment and materials. The railway managements long were largely successful in effecting the needed economies. Before government control was adopted, however, the increases in expenses had begun to come so fast as to be overwhelming. The railway managements repeatedly appealed to the government regulating authorities for assistance and relief, but they either did not get adequate assistance and relief, or they always failed to get them in time. Now that the government itself has assumed control of and responsibility for railroad operation, perhaps government officers will come to a fuller and juster appreciation of the ever-increasing difficulty of the problems with which railway officers have been wrestling.

Meantime, railway officers, as far as they are given opportunity, should apply themselves with their old-time energy and efficiency to fighting expenses. That a large advance in rates will be required to save the government from having a heavy deficit appears certain; but railway managers should and undoubtedly will strive to make the advance in rates required as small as possible. The well-being of the public, the reputations of railway officers themselves, and the future welfare of the railways demand that they shall do so. As to the Railroad Administration, it should recognize the fact that the railway managers cannot do their best without adequate incentive and full opportunity.

Expedite the Rail Program

IN NORMAL YEARS, at this time, most of the roads have a large part, if not all of their season's purchases, of new rail on hand and distributed and have gangs at work putting it into the track as fast as possible. This year almost nothing is being done in this direction at present, although there is a greater need for prompt action than ever before. As the ordering of new rail and the authorization of programs of renewals involving charges to capital of any magnitude are now concentrated in the hands of the director general, the railways are unable to proceed with much of this urgent work until permission is received from Washington.

The roads have emerged from one of the most severe winters in their history, as a result of which the wear and tear on tracks has been particularly heavy. Furthermore, for the last year the roads have been handling an enormous traffic and as wear on rail is largely proportionate to the tonnage passing over it the depreciation has been more rapid than normal. This condition follows several years of inadequate rail replacements. As indicated in our issue of April 5, page 912, the rails rolled for domestic consumption during 1914, 1915 and 1916 averaged over 825,000 tons, or 28 per cent less than the average for the period of 1902 to 1913 inclusive. Considering the fact that the latter part of the period ending with 1913 was one of reduced railway earnings and that the mileage of tracks is increasing each year, it is evident that there is now an accumulated deficiency of several million tons of rails. One close student of this subject has placed

this figure as high as 10,000,000 tons, or more than the normal tonnage rolled in three years.

The present inactivity is disquieting in view of this large accumulation of deferred maintenance. The steel mills still have on their books a considerable tonnage of rails contracted for 1918 delivery. However, many roads have no rails on order and the director general has issued instructions that all rails will be ordered through the central purchasing department so that these roads are now without authority to order the rails so sorely needed. Furthermore, the steel mills themselves are working very largely under priority instructions, which determine the products to which they shall give attention. As a result, in spite of the fact that this is the season at which they should normally be rolling rails to capacity in order that the roads might get them into the tracks, they are now turning them out only to about 25 per cent of their capacity.

It may be worth while in this connection to call attention to steps which Canada has been forced to take to meet a similar, although somewhat more aggravated, situation, which has resulted from failure to make the normal renewals during the last three years. Following the outbreak of the European war in 1914 the Canadian steel mills came under the direction of the Canadian government to the extent that the products which they should turn out were specified. As a result attention was concentrated almost entirely on war materials to the exclusion of rails and other railway supplies. Last year the roads secured an emergency order for the rolling of a small tonnage of rails to tide them over. However, conditions have continued to become so acute that many tracks have been taken up to supply materials for service in others. Within the last few weeks the Canadian Minister of Railways has bought 37,375 tons of steel rails of 67.5 lb. section which were rolled in the United States for the Russian government, but which have been held at the eastern seaboard undelivered for some time. Although these rails are of a different section from any now used in Canada, they are being taken to relay branch lines from which heavier rails may in turn be released for main line use. Likewise the Canadian Minister of Railways has ordered 100,000 tons of 85-lb. steel rails from the Dominion Iron & Steel Company, which will be divided between the four principal roads of Canada, and has instructed this mill to work on them continuously until the order is completed.

While the railways of the United States have not yet been reduced to such sore straits a continuation of the present inactivity will hasten this condition very speedily. If the delay in ordering rails, in rolling those which are now ordered, and in granting authority for the laying of those which are now available is long continued it will be extremely difficult if not impossible to get the requisite tonnage into the tracks this year.

Furthermore, with the prevailing shortage of labor which will become more acute as the season advances, it will be impossible for the roads to build up and retain adequate forces if they come into the market after other employers have secured the best, if not all of the men. Even where it may be possible to recruit the necessary forces later, the decreased efficiency of the men then available and the more adverse working conditions during the hot summer months will add materially to the cost of the work.

Maintenance of way work of all classes is being allowed to lag this year, when of all years it should be pushed to the maximum. While the time already lost cannot now be recovered it is imperative that every possible step be taken to expedite the work from now on in order that the roadway and tracks may be placed in as good condition as possible to handle the abnormally heavy traffic which it now has and probably will continue to be called upon to carry. A large part of the more important maintenance of work is seasonal in character and a day lost now is more important than a week in the fall or winter.

Chamber of Commerce of U. S. Sounds Warning

Points to Danger of Further Delay to Manufacture of Railroad Equipment Through Standardization

RESOLUTIONS PASSED by the Chamber of Commerce of the United States at its annual meeting at Chicago last week indicate that business men recognize the railroad problem as a vital one in our national life and that they are taking a keener and more intelligent interest in transportation than ever before. They see the necessity of providing against a repetition of the railway crisis of the past winter and urge that standardization is secondary in importance to the prompt placing of orders for locomotives and cars. They also recommend the unified operation of railway terminals and the calling of a conference at some future date at which representatives of all interests affected by transportation can voice their views on the proper organization and control of the railways following the termination of government operation. All of the resolutions passed which bear on the transportation question follow:

Transportation Necessities

Resolved, That the Chamber of Commerce of the United States urge upon the Director-General of Railways the favorable consideration of the following suggestions relating to present pressing transportation problems:

(1) The efficiency of the railroads depends in large measure upon the unified control and operation of terminal facilities. To accomplish this effectively it is recommended that the operation and use of the railroad terminal facilities in each large city be placed under the supervision and control of a single competent individual.

(2) Railroad equipment, including motive power and car supply, is inadequate for present traffic and threatens to become so insufficient during the coming autumn and winter as seriously to restrict the industries and trade of the country. The public interests urgently require the promptest possible placing of orders for locomotives and cars in sufficient numbers to provide the transportation that the country must have in order to prosecute the war vigorously.

(3) While the standardization of railroad equipment is important and merits careful consideration, it should be recognized that standardization is secondary in importance to securing as quickly as possible the locomotives and cars required to handle the increasing traffic that must be transported in order to keep the industries of the country in full operation and to maintain the steady flow of materials to the seaboard for shipment to Europe.

Railroad Conference

Whereas, The Chamber of Commerce of the United States recognizes the vital importance of developing a definite public opinion as to the best methods of conducting the transportation service of the Nation, after the conclusion of the present government control;

Resolved, That the Board of Directors of the Chamber of Commerce of the United States be requested to call a conference which shall be truly representative of all the interests of the Nation—financial, industrial, commercial, agricultural, civic and social—affected by transportation, such conference to be called for such time and place as in the judgment of the Board seems advisable.

The purpose of this conference shall be to consider the broad aspects of the transportation problem and the formulation of a basis for the control and operation of the transportation facilities of the United States after the conclusion of the present government control.

Supreme Devotion An Inspiration Buy Bonds! Sacrifice Till It Hurts!

Washington, D. C., November 21, 1864.

Mrs. Bixley,
Boston, Mass.
Dear Madam:

I have been shown in the files of the War Department a statement of the Adjutant General of Massachusetts that you are the mother of five sons who have died gloriously on the field of battle. I feel how weak and fruitless must be any words of mine which should attempt to beguile you from the grief of a loss so overwhelming. But I can not refrain from tendering to you the consolation that may be found in the thanks of the Republic they died to save. I pray that our Heavenly Father may assuage the anguish of your bereavement, and leave you only the cherished memory of the loved and lost, and the solemn pride that must be yours to have laid so costly a sacrifice upon the altar of freedom.

Yours very sincerely and respectfully,
Abraham Lincoln.

Waterways and Highways

Whereas, It is apparent that the present traffic burden is beyond the capacity of the railroads, and that the vigorous and successful prosecution of the war is hampered thereby; that it is therefore imperative that our great rivers, canals and inter-coastal water routes, as well as our main highways, should be forthwith used to move freight;

Be it therefore resolved by the Chamber of Commerce of the United States that the government, through the President and the Director-General of Railroads, be petitioned:

(1) To organize and operate existing equipment and construct new equipment for use upon the inland and coastwise waterways in accordance with the authority recently conferred by Congress in the Transportation bill.

(2) To complete trunk highways for heavy traffic where they can be useful in relieving railroad congestion.

(3) To adopt a permanent policy, assuring co-ordination of railroads, water routes and highways for traffic service.

The meeting of the transportation section of the Chamber of Commerce of the United

States took place in the Elizabethan room of the Congress hotel, Chicago, on April 11, with an attendance of about 250. Harry A. Wheeler, chairman of the Committee on Railroads of the Chamber, presided at the session devoted to railway transportation, and F. A. Seiberling, president of the Goodyear Tire & Rubber Company, was chairman of the subsequent session on highway transportation. Four papers were read at the railway session, one of which, on "Motive Power" by Alba B. Johnson, president of the Baldwin Locomotive Works, was published in the *Railway Age* of April 12, page 965. The other addresses were on "Terminals" by John F. Wallace, chairman of the Chicago Railway Terminal Commission; "Car Supply" by Samuel O. Dunn, editor of the *Railway Age*, and "Extensions" by Francis H. Sisson, vice-president of the Guaranty Trust Company, New York, and formerly assistant to the chairman of the Railway Presidents' Advisory Committee at Washington, D. C.

Francis H. Sisson's paper on Extensions is given below:

Laying the Rails for Future Business

By Francis H. Sisson,

Vice-President, Guaranty Trust Company of New York.

For a period of 30 years, with an increasing intensity of action, this country has pursued the policy of constriction and starvation towards its arteries of commerce, through which the life blood of the body economic must flow. Sclerosis and paralysis inevitably followed.

The present government control of the railroads, while representing a progressive step, cannot be considered as offering a solution; it is a temporary and extreme measure, forced by the exigencies of a great crisis for which there had been no preparation.

The incalculable importance of the railroads in every phase of our individual and national existence was dramatically, I might even say tragically, demonstrated last winter, when the grim spectres of cold, hunger and want stalked in the wake of transportation paralysis. Never before in our history have we so thoroughly appreciated the importance of distribution as an economic factor. It is to be hoped that we shall never forget this costly experience.

The demands of war, sudden and colossal as they are, have not been responsible for this deplorable state of affairs; they merely accelerated and accentuated the inevitable result which would have come sooner or later under existing conditions. We are simply reaping the harvest of a decade of railroad baiting born of ignorance, prejudice and political expediency, which, as a people, we did not understand, and the consequences of which we did not anticipate.

Punishment visited on the many for the sins of the few, the reduction and limitation of rates, the multiplication of regulations and regulating bodies, the increase of taxes and impositions, the rising costs of labor and material, have for the last 10 years added new bonds to bind this modern Gulliver of ours, until he lay helpless, the victim of those he should live to serve. The strong hand of the government, in taking over the railroad situation, has released many of these shackles, and by co-ordinating direction and operation is restoring that ability to serve which had been denied the achievement of its purpose.

But the foundations for the unprecedented economic struggle which inevitably will follow the present armed conflict must be laid now. We were woefully unprepared for war; we dare not be equally unready for peace. And one of the chief factors in preparing for the future unquestionably is that of railway extension; for the carriers will play as important a part in helping to win the battles of the prospective international combat in trade fields as they are today in speeding our military strength to the battleline of freedom for the victory which democracy must and will win.

Are these great weapons in our commercial warfare to be privately or publicly owned and operated? Why have they not been equal to the occasion and how can they be made so? Can preparations for the future be made in the light of the past?

It is certain, if we are to have private ownership of transportation, the cornerstone of the foundation of our future facilities must be the restoration of railway credit. The companies must be enabled to raise the means to develop those much needed facilities adequately. The folly of the government's attitude toward the railroads in the past has been strikingly exemplified in the policy of restricting the earnings of the roads without any guarantee of return to them. Naturally the result was to undermine railway credit and to rob the companies of the only source at their disposal for increasing their services to the public.

The increase in the population of the country in the ten years from 1908 to 1916 was a little less than 20 per cent. A commensurate increase in commercial and industrial ac-

tivity to meet this growth and the new conditions we face will require a proportionate increase of ton mileage per capita which can only be made possible by an increase in railroad trackage. Such extension can be made possible only with private capital, which will not be attracted to the railroad field until that field is put on a par with others.

The demands of war must be met at whatever price they exact, and there is no doubt that the government will proceed as far and as rapidly as possible to meet them. It is imperative to do so. But one cannot help thinking of the incalculable advantage which the government would have at present in speeding up our martial activities if the roads had been allowed sufficient return on the capital invested in them to have made the proper extensions and to have provided the necessary equipment. Money, materials and men which now could be devoted to the production of munitions will have to be allocated to the improvement of our transportation facilities. And every productive resource, every minute, is precious.

But this unfortunate state of affairs should have a beneficial effect. It ought to impress upon us the need for wiser provisions, particularly with reference to intensive development in order to cope with the problems which will be created as soon as peace is declared.

Unless the government's future policy toward the railroads is such as to insure fair regulations and just returns, which will be absolutely essential if new capital in sufficient quantity is to be attracted to the extension of our transportation facilities, the development of our great resources in the West, Northwest and Southwest will be arrested. And the retarding of such development now, of all times, would be a national economic disaster.

During the remainder of the war, the government and industry will not be able to spare the productive energy to make these extensions. At best there will be an increase in the amount of equipment, and a co-ordination of railway lines and of terminal facilities will undoubtedly increase the ability of the railway system to carry a larger amount of traffic.

Under-maintenance of the existing roads is likely to be the characteristic feature of the operation of the railroads during the war, and it will mean that on the return of peace American railways will have to put a great deal of money into improvements and betterments and into extensions of the lines in order to catch up to the demands of the business of the country. It is roughly estimated that for every dollar of increased gross return, \$5 should be spent in extensions and improvements.

Construction work of any character at the present time would draw money, materials and labor from the more pressing and immediate needs of war. But we can and should plan for them at the earliest possible moment, and in the meantime we should make adequate provision for the maintenance of the roads, for unless the roads are properly maintained, new extensions would be almost futile.

The government should definitely protect holders of American railway stock by providing that the money equivalent of maintenance expenditures, plus a deferred maintenance reserve (which ought to be established) for each year of government operation, should bear a relationship to the average monetary expenditures of the railways for maintenance for 1915, 1916 and 1917, as indicated by the increased cost of maintenance materials in each year of government operation, as compared with the average cost for those three years.

One vital fact is apparent today above all others; the scepter in the railroad world has passed out of the hands of the railroads' executives and the bankers who financed them. The American people control the situation through their political representatives, and they will determine the whole course of the future. The burden of right decision

lies with them, and they will suffer, or prosper, in accordance with the wisdom shown.

No class of people will exercise so powerful an influence in reaching this decision as the shippers; they must learn, if they have not learned already, that the thing of most vital importance to them is getting their goods to market. The prices at which this service is rendered are incidental to having such service prompt and adequate. The long struggle of the shippers to hold down rates in defiance of the economic trend of the times, and the obvious necessities of the railroad situation, has worked the undoing of the shippers, as well as of the railroads, and they are suffering under the situation they themselves have largely caused. To serve their own ends in the future, they must take a constructive attitude toward the transportation question, and lend a hand in the successful solution of the problem.

It is obvious that we should adopt a definite, comprehensive and adequate policy for developing our railroad extensions, a policy based upon definite, determining factors. Our railroads must keep pace with our industrial expansion; it is imperative that this relationship be strictly maintained. Our transportation facilities must not be outstripped by the growth of our population; they must, in fact, respond fully to the increasing needs of our people. In other words, if we would avoid a repetition of the economic strain through which we have just passed as a consequence of the transportation situation, our railway extension policy must be directly predicated upon the increases in our population and our business.

Various suggestions of a central federal corporation, regional holding companies, government guarantees and plans calling for profit sharing with the government above a fixed return have been frequently made. Somewhere along this line of thought lies a rational solution. It is very certain that the old days of enforced competition, anti-trust

laws, anti-pooling laws, conflicting state regulation, wasteful competition, duplication of service, would not be permitted by a public alive to its own interests.

It seems equally certain that government ownership would not be permitted if the public were equally alive to its real interests. The hour has arrived for the suggestion of some plan which will be ready for adoption when the crisis of war has passed, and the pressing needs of business demand the return of normal business conditions, and the operation of economic, rather than martial law. Somewhere, within the meaning of the words "co-operation" and "partnership" lies the answer. The public interest in transportation is paramount and must be protected, but public interest and

private interest need not be in conflict if intelligently regarded.

Regional companies representing both private and public capital under private operation with governmental participation in the management and earnings above a just guarantee would seem to assure the necessary extension of railroad facilities. In unity of interest and understanding progress towards the desired goal should be possible.

Problem of Car Supply Serious

Mr. Dunn spoke on the subject of Car Supply as follows:

Business men naturally are profoundly concerned at this time regarding the question of how nearly adequate to the demands the supply of railroad transportation will be the rest of this year, and, in fact, during the rest of the war. The subject assigned to me, as it appears on the program, is "Car Supply." I assume it was intended that I should discuss this subject in its broader rather than in its narrower aspects.

During the last 11 years we have become accustomed to the use of the terms "car surplus" and "car shortage." The transportation conditions denoted by these terms have not, however, been solely conditions of car supply. They have been conditions of transportation supply in the broadest sense. Paradoxical as it may seem to the uninitiated, you might actually have an excessive supply of cars upon the railways, and at the same time have reports and complaints of car "shortage" throughout the country. You may theoretically have sufficient cars for all transportation purposes, and yet have so many accumulated at seaboard ports or in terminal yards, or in the hands of shippers, for loading and unloading, that the total requisitions made by shippers will exceed the number of cars the railways can furnish to them. These conditions may be due to inadequate facilities for loading and unloading cars, or to inadequate locomotive

power; or to inadequate trackage or terminals. Such conditions actually have existed repeatedly.

In other words, car supply is not transportation supply. It is, however, an indication of the condition of transportation supply, and, in fact, is the best indication of it that we have. Now, it is hardly necessary to tell this body that, as indicated by the freight car supply, there has been in this country for two years a serious deficiency of railroad facilities. On March 1, 1916, for the first time in 2½ years, the American Railway Association reported a net shortage of cars. This was due mainly to weather conditions and to an acute congestion at the eastern seaports. It soon disappeared and did not return for five months. On September 1, 1916,

Railway Men will Do Their Share

By William Sproule

President, Southern Pacific

The Third Liberty Loan is the third line of reinforcements in money for the support of the fighting fronts. The rank and file of railroad men know that it costs daily an immense sum for the upkeep of a railway system, and a railway system is not unlike an army system. A railway system combines large organization and healthy discipline with commercial flexibility; hence to railroad men the appeal is specially strong that money is the sinews of war. It is further enforced by the constant lessons they receive and practice in operating economies to avoid the waste of money. It finds them ready to perceive that it takes money to organize and maintain armies. As trained men in a system of highly developed organization intended for the pursuits of peace they are quick to realize the importance of adapting the organization now to pursuits of war also, and they are quick to see that military organization for purposes of war is akin to railroad organization, but on a complex, vast and strenuous scale.

By natural process, therefore, the mind of the railroad man gives easy access to the idea that underlies the Liberty Bond; namely, that we are fighting for our personal and industrial freedom and that it takes money in continuous flow to win the fight. The railroad man travels freely by virtue of his calling and knows the great extent and resources of this nation better than the average man, and he is a dullard who does not soon acquire for his country that admiration which is the essence of love.

The men of the rail have volunteered for the railway regiments and have met their country's call in a way that shows they will do their share in the Third Liberty Loan and will do it heartily.

however, a net shortage was reported again; and net shortages varying from 34,000 to 149,000 cars have been reported in every month since. This unbroken continuance of car shortage for over 20 months is without precedent in the history of American railroads.

The reasons for it become apparent when the records of increase in traffic, on the one side, and of development of facilities, on the other side, are compared. Never were there known such augmentations in the volume of business offered to the railways as have occurred since the fall of 1915. The freight traffic actually moved in the calendar year 1916 exceeded that handled in 1915 by 25 per cent, and exceeded that handled in the previous record year, 1913, by 20 per cent. Never before had there been an increase in one year exceeding 16.5 per cent. In 1917 there was a further increase over 1916 of about 10 per cent. The increase of 1917 over 1915 was 40 per cent and over 1913, 23 per cent.

What changes were occurring, meantime, in the car supply? As you know, there was a heavy decline in railway traffic and earnings in 1914, and a further decline in 1915. Owing to the fact that this was accompanied by advances in wages and other expenses, the net return earned by the companies on their cost of road and equipment was reduced in 1914 and 1915 to the lowest basis that had been reached since 1899. This reduction in net return caused the railways to buy such a small amount of equipment that in 1915 there were 7,343 less cars in service than in 1914, while in 1916 there were 22,292 less than in 1915. The average capacity per car advanced meantime, and in each year there was an increase in the total tonnage capacity of all cars. But the increase in the total tonnage capacity in 1916 over 1914 was less than 2 per cent, while the increase in 1916 over 1915 was less than 1 per cent. It was not a coincidence, but a correlative development that in 1915 the number of locomotives in service was 815 less than in 1914. In 1916 the number was 946 less than in 1915. There was a small increase in the aggregate tractive power of locomotives.

Considering the tremendous increase in traffic in 1916, and the actual two years' decrease in the number of cars and locomotives in service, it was not surprising that there developed in 1916 an acute congestion of traffic and shortage of cars. In the latter part of the year 1916 and the early part of 1917 there was considerable activity in the construction of equipment, and consequently the statistics show that on the average the number of cars and locomotives in service in 1917 was greater than in 1916; but, compared with the increases in volume of traffic, the increment in cars and locomotives was almost negligible. In 1917 there were only 3 per cent more freight cars and 1 per cent more locomotives in service than in 1916. After this country entered the war, for reasons which all know, it became impossible for the railways to get many new cars and locomotives. It is almost strictly accurate to say that the roads handled the enormous traffic of 1917 without any more cars and locomotives than they had three years before. Furthermore, many of the cars and locomotives used were such as under normal conditions would have been sent to the scrap heap.

We come now to the conditions of 1918. At this point we open a new chapter in the history of American railways, for here their operation was placed under government control. There are not as yet available any statistics showing the amount of traffic which has been handled thus far this year. We do know, however, that owing to weather and other conditions, the business handled in January was less than in January, 1917. We also know that on March 1, the net shortage reported was over 138,000 cars. This is one of the largest net shortages ever reported. Furthermore, it existed in spite of the fact that numerous embargoes are being enforced which cause shippers to refrain from ordering cars which they otherwise would requisition. In other words, if it were not that many shippers know that it would do

them no good to ask for cars, it is probable that the number of cars asked for would be much larger than it is, and that therefore the net shortage reported would be much greater.

Are we going to get any relief from this situation, and if so, how and when? Theoretically, relief might be obtained by operating the present facilities more efficiently, or by providing additional facilities, or by both means.

It would seem that it ought to be possible under government control and unified operation to utilize the existing facilities more efficiently. If more efficient utilization is secured, it must and will be expressed in terms of more traffic handled with each locomotive and each car. You may secure this greater service from each locomotive and car either by moving traffic over routes which are shorter between the points of origin and of destination than those heretofore used, or by loading each car and each locomotive heavier without reducing the average speed with which they are moved, or by both means. Many people believe that a large increase in efficiency will be secured by moving traffic over the shortest practicable routes. But in periods of heavy traffic the shortest routes between important terminals can handle only a comparatively small part of the total business; and the bulk of the business must be allowed to overflow into longer and longer routes until all routes may be filled up. While a gain may be made by re-routing traffic it would be easy to exaggerate the increase in efficiency which will or can be obtained by this means.

It probably is still true, as it has been in the past, that the most sure and feasible means of increasing the efficiency with which facilities are utilized is to load and unload cars as promptly as practicable, and to load both cars and locomotives as nearly as practicable to their maximum capacity. Doubtless more can be done along this line, but those who have closely followed the tremendous efforts which have been made year by year, and especially during the last two years, to increase the amount of traffic handled with each car and locomotive are likely to conclude that it is going to be a very difficult matter to so operate existing facilities as to cause them to handle any considerable larger amount of traffic in the near future. The facts appear to be that, as a result of developments during the last dozen years, and especially within recent years, with which you are all familiar, the growth of the country's transportation capacity has been much less than the growth of its productive capacity, and that there is no real remedy for the conditions resulting except an increase of transportation facilities.

What are the prospects of an early increase of facilities? Let us survey especially the situation with respect to freight cars. Cars, like most other things, wear out, and the statistics bearing on this matter indicate that in order merely to prevent an actual reduction in the number of really useful cars in service it is necessary to build at least 125,000 cars a year. The number built in 1917 was 119,000. Consequently, there are just about as many cars in service now as there were last year. Under normal conditions our car building plants could, perhaps, turn out upward of 250,000 cars in a year, but practically their capacity is limited at present by their ability to get materials and labor, especially materials. As I have already remarked, we have a large car shortage at present. The crucial period in every year's railroad operation comes in the fall and winter. Will there be before that critical period comes this year any considerable increase in the number of cars available? Since January 1 only 5,000 cars have been ordered, and they have been ordered to be built in the shops of one of the railways which has not yet financed the undertaking. The car builders have been working thus far this year on orders, both foreign and domestic, received last year. Practically all orders will soon be filled. The total cars built under them for domestic use this year may amount to 25,000.

The Railroad Administration, as you know, is preparing

to place an order for 100,000 cars. The material situation is such that if this entire order were placed today it would be practically impossible for the builders to begin to turn out the new cars before August 1. It would take them three months to procure their materials and get to work. They would then have six months of the year left. It has been estimated to me by a very high authority that it is highly improbable that all the car builders can build more than 8,000 or 10,000 cars a month. It would appear then that if they should be given the order for 100,000 cars now they could hardly build more than 50,000 or 60,000 of them before January 1. This would make the total year's output of cars for domestic use 75,000 to 85,000, as compared with the minimum of 125,000 which it is necessary to build merely to maintain the existing supply of equipment. It would appear, therefore, that there is likely to be during this year, as there was in 1915 and 1916, an actual reduction of the number of cars in service. Furthermore, not more than 30,000 to 40,000 of the new cars the Railroad Administration is planning to order can possibly be built in time to be available for service when the crisis in the transportation situation comes in the late fall and early winter. Similar general conditions prevail in the locomotive field.

Very soon after government control was adopted it was forcibly and repeatedly pointed out by persons familiar with conditions and with the normal course of events, in the transportation and the railway material fields, that it was extremely desirable for orders for locomotives and cars to be placed as early as practicable. The reasons for this were pointed out. What actually has been done? The Railroad Administration has prevented individual railroads from ordering cars and locomotives, and has spent several weeks in considering the question of standardization of equipment.

Having formulated its standard specifications, it is now spending additional weeks in negotiating with the railway equipment and supply manufacturers regarding the relinquishment of patents, the foregoing of royalties, and kindred matters which it seems neither right nor necessary to raise at this time. These delays in ordering cars are going to have a serious effect upon the number of cars built this year unless the orders for locomotives are placed soon. A similar effect will be produced in the locomotive field. If at the start the Railroad Administration had authorized the individual railways to purchase their normal requirements of locomotives and cars in the usual way, giving them the backing of the government's credit, the prospect of an increase instead of a decline in the amount of available equipment during the year would be much brighter. The builder, before he can begin to build, must assemble his material and get his labor, and before he can do these things he must

know how many cars or locomotives he is expected to build. These things take time, and never did they take so much time as at present. Whether the Railroad Administration will in the long run save any money to the public by taking precious time to consider such questions as locomotive standardization and the relinquishment by manufacturers and inventors of their patent and royalty rights, is extremely doubtful; but that by doing so it is going to cause a slowing down rather than a speeding up of the transportation machine, when speeding up will be most necessary,

While I have dwelt chiefly on the car situation, because that is the subject specifically assigned to me, the locomotive situation is fully as serious. A large part of the delays and congestions last winter was due to shortage of serviceable locomotives. Everything that ought to be done, but which is not done, to speed up the production of locomotives adapted primarily to the conditions under which they are to be operated will tend to cause a recurrence of the conditions which existed on our railways last winter.

We are in the midst of a revolution in the transportation business. Government control was adopted to save the railways from financial disaster and to speed up their operation and development so that they should be able to handle all traffic essential to carrying on the war and in addition as much other traffic as practicable. Perhaps it is unfair to say so, but to some observers it appears that in certain high places more effort is being made to effect a drastic and permanent change in the organization and methods of the railways than to so equip and operate them as to make them as rapidly as possible the most efficient transportation instrumentality possible for helping win the war.

What I have said about present and prospective conditions with respect to car supply is not adapted to cause

optimism regarding the transportation situation which is going to exist the rest of this year and in the early part of next year. It has not been intended to inspire optimism, but to present the facts. The two outstanding points with regard to the transportation situation seem to be that, first, the available freight traffic of the country is vastly larger than the railways can handle with present facilities and that, second, we cannot reasonably hope that under present conditions and with present methods the facilities will be materially increased for months to come.

In these circumstances it is necessary to do two things, first, for the railways and the shipping public to co-operate as closely and vigorously as they can to secure the best possible utilization of existing locomotives, cars and other facilities, and second, for the Railroad Administration, by vigorous use of embargoes and other methods, to give preference to traffic essential to carrying on the war and to providing

"Fight for Liberty"

By A. M. Schoyer

Vice President of the Pennsylvania Lines West of Pittsburgh, and Member of Liberty Loan Committee of Western Regional District

The Third Liberty Loan gives us another opportunity to show our President and our leaders that the railroad men—officers and employees alike—are behind the Government in this great "Fight for Liberty" to the limit of their resources and ability.

This Loan appeals to us even more than the others, because now we have our brothers and our friends at the front in engineer corps and fighting lines alike—because we cannot go ourselves, but must stay behind to keep the wheels moving in our efforts to move the food and munitions they need—and, because, being now ourselves cogs in the machinery of the United States, we are helping to make our own Government successful in its supreme effort.

From a selfish standpoint, the Third Liberty Loan offers us an opportunity for a solid investment with an adequate interest; and the Government's arrangements for subscription from railroad employees are so liberal that having saved the money through our economies we can pay it through the payrolls.

If we could make the railroad men's contribution to this Loan 100 per cent in point of number, and could see that every member of our families was represented in the list of contributors, we would be doing what must help encourage the Government and forward the great end of "Victory."

the public with commodities required for its subsistence and comfort. This will involve continuance of the denial of transportation to a large part of the non-essential businesses. The nation, by a narrow, unwise and unfair policy of railway regulation, prevented needed increases of railway facilities when they could have been made. It refused to listen to loud and repeated warnings as to the inevitable consequences. It must now in this terrible crisis pay the penalty for the injustices it has committed and the short-sightedness with which it has acted.

Now that the nation is paying the price of the policy of regulation it has followed, many persons who have a large and grave responsibility for having influenced the public to follow this policy are complaining that the railways have "broken down," and are attempting to put the entire blame for the alleged breakdown upon their owners and managers. Some of these architects of ruin are alleging that railway officers are "lying down" to discredit government control, an allegation equivalent under present conditions to a charge of treason, and advocating government ownership as the only solution of our railroad problem. The old order which they established having proved a melancholy and disastrous failure, they are becoming the prophets of a new, and as they contend, a holier dispensation.

It is rather difficult to believe that the American people will follow them farther. So long as the development of our railways under private ownership received encouragement instead of discouragement the expansion of railway facilities went on faster in this country than in any other in the world. In 1913 the freight cars of our railways had six times as much carrying capacity in proportion to our population as those of the railways of Germany, and they actually handled five times as much freight traffic in proportion to our population as did those of Germany—and the railways of Germany have relatively the greatest freight carrying capacity of any government-owned railways in the world. During the war we can do little to repair the harm our restrictive and repressive policy of regulation had done before the war. We can, however, inform ourselves of and disseminate the facts which demonstrate that private management is more conducive than government management to efficient operation and adequate development of railway facilities. We can insist that government control shall be used solely as a war measure, and not so as to make a return of the railways to private management almost impossible; we can apply ourselves to formulating a policy of private ownership and public regulation which, if adopted after the war, will cause the needed revival of the expansion of railway facilities; and we can devote some of our time to educating public opinion so that after the war there will be a chance to get a sane and constructive policy adopted.

Surely our transportation experience in the year before we entered the war, and in the year since we entered it, has taught us a lesson which we shall not forget after the war. This great body, representing all the large and important business interests of America, is ideally situated and ideally fitted to so educate and lead public opinion that the transportation conditions which now so greatly trouble us will be remedied, and their recurrence will be forever prevented.

Wallace on Terminals

Because of the unavoidable absence from the meeting of John F. Wallace, chairman of the Chicago Railway Terminal Commission, Edward L. Noonan, chief engineer of the Terminal Commission, read Mr. Wallace's paper on Terminals. An abstract of the address follows:

The terminal problem is really the big problem of our railroad transportation system and its solution will automatically solve most of our transportation complexities. While the total mileage of terminal tracks may not be too much—and in certain localities may even be insufficient—the remedy

lies not entirely in additional tracks but in a co-relation and readjustment of existing facilities and the operation within the terminal zone along lines that will secure the maximum of efficiency.

The investment in terminals more than equals the total investment in all of the railroad property outside the terminals. The investment in a recently constructed passenger terminal represented an amount sufficient to build a double track railroad—exclusive of secondary terminals—of a length equal to the length of all of the railroads entering that terminal.

Viewed from the standpoint of delays, the railway terminal becomes even a larger factor in the transportation problem. The average freight car travels about 25 miles a day. The average speed of a freight train between terminals is 10 or 15 miles an hour. It is therefore evident that the average freight car spends 12 hours in the terminal for every hour it spends between terminals.

Heretofore discussions as to the solution of the terminal problems of our country have been more or less academic. All of these discussions clearly pointed to the necessity of co-operative operation of railroad terminals and, in fact, of the railroad transportation system as a whole, but the railroads were without the legal authority to inaugurate this change. With the taking over of the railroads by the government it will now seem that if a proper treatment of the railroad terminal problem were worked out now the means were at hand to place this solution into practical operation. Important that the general public comprehend the fundamentals of the present transportation situation and the general nature of the changes in operation and control necessary to bring about a more efficiently operated transportation system. These changes will necessarily be of two kinds: First, physical changes in terminal facilities, and, second, changes in method of operation.

Following a discussion of the passenger terminal problem, Mr. Wallace took up the question of freight terminals.

In all modern city planning consideration has been given to the proper treatment of railroad properties. But more attention has been paid to the passenger than to the freight terminal. This has been due to the fact that the passenger station has always been more or less monumental and lends itself readily to harmonious architectural treatment in connection with other civic and governmental structures, while freight facilities have usually been accommodated in one-story, simple structures, intermixed with surface tracks.

Another reason has been—if this phrase can be permitted—that the passenger station has been in the front yard and the freight station in the back yard. Yet, as a matter of fact, in many localities existing superficial freight development has been the great barrier to the healthy and logical growth of municipalities.

The freight traffic of a railroad terminal is divided into c. l. freight and l. c. l. freight. Carload freight is divided into that which originates in or is destined to points in the terminal zone and that which is transferred from one railroad to another for hauling to points more or less distant from the terminal zone.

This interchange freight should receive first consideration. It frequently happens that a car of commodities consigned from a point in the West to a point in the East is handled successively by several railroads and at every place where it passes from one railroad to another it goes through a terminal, often passing through the hands of an intermediate company, occupying space in several yards, congesting interchange tracks and encountering days of delay.

The remedy for this condition is more direct routing—and a routing that will pass the car around rather than through the larger railroad terminals. Under present practice a car may be handled miles out of its direct course to destination in order to give a greater mileage to a preferential railroad. Frequently the shipper is equally guilty with the railroad for

this condition. The interest of economy demands that the car should pass in as direct a line as possible and with a minimum of delay from the point of origin to destination, over the most economic route.

The car originating in or destined to a point within the terminal zone is another problem, the solution for which is unified operation of railroad terminals. At present each railroad has its own system of tracks and terminals within the terminal zone and seeks to operate traffic to its individual advantage without regard to the ultimate economy of complete terminal operation.

To inaugurate unified operation it should be possible—even during the temporary period of government control—to provide that each railroad terminal zone should be operated as a unit by one local manager. This local manager should take over all of the railroad facilities within the terminal zone and handle all the traffic therein.

Railroads entering the terminal zone should turn over their traffic to the local manager at points designated by him, and he should proceed to handle this traffic to its destination within the terminal zone along the most direct and economic routes and with a minimum of switching and delays. Originating traffic should be handled in the same way.

If such a plan were put in operation—using only existing facilities—the beneficial results would be immediately apparent and future investment in terminal improvements should be along lines that would promote and not hinder this unified operation of terminals.

Competitive operation has been the principal factor in shaping the development of the present system of handling l. c. l. freight. Fundamentally, the application of the co-operative principle is the only solution of the present unsatisfactory condition, yet the application of this principle is most difficult because it involves a complete change in the present method of handling this class of business and requires the construction of facilities along radically different lines than now obtaining.

In the handling of l. c. l. freight three interests are involved: the shipper, the railroad and the municipality.

The shipper is interested in expedition of shipments, convenience of trucking and cost of service; the railroad is interested in the investment required to furnish the necessary facilities and economy of operation; the municipality is interested because facilities for handling l. c. l. freight are usually located contiguous to congested business centers and if not properly developed may restrict the logical growth of the city and cause congestion of street traffic.

Any solution that is put forward for handling this class of traffic must provide a well balanced scheme in which due consideration has been given to all of these interests.

This solution will require such an arrangement of facilities as will permit of a free flow of street traffic, economical railroad operation, expeditious handling of freight, and utilization of expensive real estate to the fullest possible degree.

With the possible exception of the freight facilities being constructed in Chicago at the present time by groups of railroads entering the Union station, there has been no advance in the past 40 years in the handling of the l. c. l. freight.

The railroads referred to occupy a restricted area and were prevented from expanding this area. As a consequence, they were compelled to resort to the utilization of more than one level, thereby marking the first real advance in this country in the method of handling l. c. l. freight.

The conditions which brought about these changes exist in other sections of this same city and in many of the larger terminals of the country, and it is believed that the operation of these freight facilities will be helpful in causing railroads to adopt similar treatment in other localities.

But this development in this particular territory would not be possible except through the co-operation of the railroads owning property in the district. It happened that these railroads did not serve competitive territory, so that while construction was along co-operative lines there was no necessity to take up the consideration of co-operative operation as applied to handling of freight to joint competitive territory.

These conditions will not exist in other localities so that ultimately the full principle of co-operative operation will have to be put into effect before a complete solution of the whole terminal problem can be brought about.

It is a safe general deduction that where a town situated some distance from a main distributing center is reached by two railroads, each of which reach the same distributing center, that one of these roads is the more economic—distance and grades considered. In other words, it will cost more to transport a car of commodities over one of these railroads than over the other to this particular town and in the interests of economy and efficiency the commodities to this town should be handled over the most economic route.

The full application of this principle cannot be made until there is unified operation

of transportation systems, either through government ownership, through the unified control of all of the railroad properties under one operating management or in groups serving natural traffic divisions, or until some form of pooling of earnings and expenses is legalized.

As an example: Under average conditions about 40 cars of l. c. l. freight are shipped each day from Chicago to Kansas City and these 40 cars are shipped over seven different railroads. All of these seven railroads are not of the same length between Kansas City and Chicago, nor have all of them equally low grades, nor are they all on a parity in regard to the other facilities which may make for economy of operation. It is therefore evident that the cars between these two towns that are not handled over the most economic route are handled at a loss and that this loss must be absorbed by all of the roads since, as a rule, advances in freight rates are predicated on the showing of groups and not of individual roads. This is but a single example. When it is remembered that, on an average, over 2,000 cars are shipped from Chicago daily and of these over 1,200 are shipped to competitive points, some appreciation can be had of the importance of applying a proper solution to this phase of the problem.

The average loading of l. c. l. cars is about seven tons, while the capacity of the car is usually several times this figure. By combining shipments, as outlined above, a

Why You Should Buy Liberty Bonds

By Howard Elliott

Chairman of the Executive Committee of the Northern Pacific, and Member of the Liberty Loan Committee for the Eastern Regional District

Every loyal citizen should subscribe as much as he or she can to the Liberty Loan.

The loyalty and patriotism of railroad employees is not excelled by any class of people in the United States, and I hope and believe this will be reflected in a prompt and generous response to the requests for subscriptions to the Third Liberty Loan now being made by the Government through the managements of the various railroads.

Only a few of us can go to the front and fight, but nearly all of us can practice self-denial and support those who do, and it is our duty to give this support to the limit of our ability.

heavier loading can be secured, which would be reflected in reduced operating expenses and relief in car shortage.

This heavier loading could be secured even under existing routing if, instead of loading cars to destination at the main terminal, shipments were grouped with reference to operating divisions of the railroad and handled in fully loaded cars to one or more division points distant from the main terminal and there sorted and reloaded in order of destination in the next division.

In conclusion it may be safely stated that the solution of all railway terminal problems as well as the operation of our transportation system as a whole must be predicated on a clear conception of the principle that there can be no conflict between the interests representing the railroads and the interests representing the public. Each is dependent on the other. An injury to one will be an injury to the other.

Existing investments in railroad properties are entitled to protection. The railroads must be permitted to make such a financial showing as will enable them to secure capital for future improvements at reasonable rates.

On the other hand, the public has a right to demand such reorganization of the transportation system as will permit the maximum of economy and efficiency. This can only be accomplished through joint or co-operative operation and such operation will eventually permit of a more scientific determination of freight rates and a readjustment of these rates along just lines. It is sincerely to be hoped that before the present governmental control is surrendered, a full discussion will be entered into on all of these matters and a method of treatment evolved that will be in harmony with these fundamental principles.

Discussion

There was considerable discussion of Mr. Wallace's paper. Emory R. Johnson, professor of transportation and commerce of the University of Pennsylvania, expressed the opinion that it was practicable to join roads in the large cities by laying connecting tracks and to introduce joint operation of terminals, but he believed that real unification in the physical sense of the term was not possible until the termination of the war. Mr. Noonan agreed with this view, but was confident that appreciable economies were available to the railways if they would place one local manager in charge of a terminal with authority to introduce unified practices regardless of the separate interests of the roads involved. Carload traffic destined to particular points could be concentrated and moved over a single line with less delay than under conditions of individual operation. Less than carload freight could be distributed among the various houses to prevent congestion on any line or lines. Certain stretches of track might be laid to complete existing belt lines, thereby facilitating the routing of freight around, rather than through, a city.

A. E. Beck, of the Merchants' & Manufacturers' Association, Baltimore, and N. B. Kelly, of the Philadelphia Chamber of Commerce, told of the unified practices which had been introduced in their cities. In both instances war emergency committees composed of business men and railway operating executives were formed previous to introduction of government control and freight traffic, both c. l. and l. c. l., was pooled to prevent congestion on one line while another line was open. The work of these committees has since been taken over by sub-committees of railroad officers reporting to the regional director of eastern railroads. In this connection, Mr. Kelly remarked that government control was, in effect, the legalization of pooling, and that pooling under private operation would have accomplished practically the same results that are now being achieved with the concentration of authority in the director-general.

F. C. Batchelder, president of the Baltimore & Ohio Chicago Terminal, stated that railway operation was now

unified in the Chicago terminal district and that while no one man was in charge, an equivalent result had been achieved by placing control in the hands of a single committee, made up of men thoroughly familiar with conditions in the city and with power to inaugurate any and all changes in practice that they deem advisable.

Discussion of Alba B. Johnson's Paper

The address of Alba B. Johnson, published in the *Railway Age* of a week ago, was followed by informal remarks which the speaker made in response to questions by his hearers. Chairman Wheeler inquired whether the capacity of locomotive shops in this country was adequate for the future needs of this country and her allies. On this point, Mr. Johnson stated that the total capacity of locomotive shops in the United States was roughly 7,000 locomotives per year. In the past the existing shops have rarely been taxed beyond capacity, and most of the time have been worked far below their capacity. The extraordinary expansion of the locomotive companies resulting from the increased foreign demands since 1915 would, he believed, provide capacity sufficient to take care of any probable demands by this country and her allies either for the present or for many years to come. These demands, however, will not be light. The wear and tear of the war has been particularly hard on motive power. The English have bled their roads of locomotives to supply the needs of their front in France. It will require the addition of 5,000 locomotives to put the French railways in good working order at the conclusion of the war. Disregarding a period of economic readjustment from war to peace conditions the productive capacity of the country will be taxed to the utmost for the next decade.

Nothing, he said, is more vital in war than an efficient transportation system, and good railroads are an impossibility without adequate motive power. The downfall of the Russian government was the direct result of its blindness in failing to maintain its railroads. While the needs of the Russian lines, according to their own engineers, demanded the construction of between 1,000 and 2,000 locomotives a year in the decade previous to the war, only about one-tenth of that number were actually built.

In reply to an inquiry as to the present output of the Baldwin plant as compared with its average production before the war, Mr. Johnson stated that in 1914 the company felt fortunate if it had orders for four or five locomotives per week; while in December, 1917, production averaged from 16 to 20 engines per day.

Water Transportation

At the conclusion of the Railroad Session Chairman Wheeler entertained the introduction of a resolution asking for more extended use of our waterway facilities, which was later passed and is published with the other resolutions in the forepart of this article. In the discussion of this subject it was pointed out that additional means of transportation of any and every kind should be used to insure a vigorous and successful prosecution of the war. The Erie canal and the Mississippi river between St. Louis and the Gulf of Mexico constitute two important existing waterways which, if properly utilized, can add 3,000,000,000 ton-miles to the freight movement of the country within 12 months.

Wheeler Speaks Before Chamber as a Whole

At a meeting of the Chamber of Commerce of the United States as a whole in the Auditorium theatre on April 10, Harry A. Wheeler, chairman of the Committee on Railroads, discussed the transportation problem from the point of view of the business man and the proper attitude to assume toward the question at the present time. He stated that the Chamber's advocacy of federal incorporation of carriers, federal regulation of securities and further centralization of rate regulation was for the time being unnecessary because

of the present scheme of railroad control by the federal government. While the immediate problem confronting the country was how to win the war, it is also imperative to look to the needs of the peace to come and to prepare a sound foundation upon which to build the scheme of transportation which will follow government control. Two groups of public men, he said, have been particularly active since Secretary McAdoo assumed the reins of railway management, one composed of these who insistently champion government ownership and the other comprised of those who just as strongly oppose it. The solution, he believes, must lie somewhere between government ownership and the old condition of private operation.

It is too early to urge any particular program and the Chamber of Commerce of the United States, representing American business men whose only interest is the most efficient system of operation, has the very definite responsibility of studying the problem carefully and assiduously with the sole purpose of championing such a course as seems to be to the best interests of the country. If it should appear that the adoption of government ownership is proper, the Chamber should have the courage to support it. If a return to private ownership, or the introduction of some new scheme of operation and control seems advisable, the organization should be equally outspoken in its favor. Preconceptions, prejudices, extraordinary conditions born of the war should be forgotten to the end that an open-minded, earnest and serious study of the problem may be undertaken and sound, practical conclusions may be reached.

Session on Highway Transportation

The group discussion of railroad transportation was followed by a session devoted to the subject of highway transportation. F. A. Seiberling, president of the Good-year Tire & Rubber Company, presided. In his opening remarks Mr. Seiberling expressed the opinion that motor truck service would dominate short haul transportation in the future. With good highways automobiles could, he thought, more than compete on even terms with the railroads within a range of from 50 to 100 miles. There are now approximately 400,000 motor trucks in the country and this number will be increased ten times within a few years unless highway development is unreasonably retarded.

Chapin on Motor Truck Transportation

Roy D. Chapin, chairman of the Highway Transportation Committee of the Council of National Defense, delivered an extended address on what is being done in the way of freight movement by motor truck at the present time and what steps are being taken to make this instrument of transportation a more important factor. He pointed to the experience of England which has found it necessary to conserve to the utmost every means of transportation. In that country, he said, all vehicles on the highways are registered

for the purpose of regulating and co-ordinating their activities to eliminate waste hauls. It is now almost a misdemeanor to operate a motor truck empty. Bureaus have been established which see to it that trucks bringing loads to a city are provided with loads to the points from which they come, and vice-versa. This plan was introduced in Connecticut during the transportation crisis of the past winter and also in Rhode Island, New Jersey and Philadelphia. In New York City particular attention has been directed to the problem of moving freight from the freight platform to the consignee and from the shipper to the platform. The store-door delivery plan, which will be introduced in that city, will have the effect of clearing the freight platforms every night and increasing the flow of business into and out of New York by 50 per cent.

Motor trucks can be of great service in moving the food supply from the country to the city. An efficient system of rural express lines is now in operation in Maryland.

These operate every day into Washington, Baltimore and other cities from points as distant as 47 miles. They are particularly advantageous because they reach many farms not on railroads or on inter-urban lines and permit the farmers to stay on the farm—a very important matter during a time of acute labor shortage. The U. S. Department of Agriculture now has a corps of investigators studying this rural express scheme and the possibilities of its extension.

Mr. Chapin cited the trains of loaded trucks destined for the front which are continuously plying our highways from points of manufacture to seaboard. In the middle of February, when the country was in the grip of unprecedented winter weather, a train of trucks made the trip from Detroit to Baltimore in 8½ days. This record was made possible by the patriotism of the communities along their route who saw to it that the

highways were cleared of snow. A time is coming, Mr. Chapin prophesied, when main highways will be cleared 365 days in the year. The Council of National Defense, he said, recently passed a resolution recognizing the value of motor truck transportation and recommending that all obstacles in the way of properly utilizing it be removed.

A. C. Bedford, chairman of the board of directors of the Standard Oil Company of New Jersey and chairman of the Petroleum War Service Committee of the Council of National Defense, addressed the group on the importance of oil conservation during the war. "Oil production," he said, "must meet the demands of the United States and its allies and will meet them."

M. H. G. Shirley, chief engineer of the state roads commission of Maryland, outlined the studies he had undertaken to determine the traffic passing over the various highways of his state and the extent of the improvement demanded by each to make for unimpeded and expeditious vehicle movement. Maryland, he said, was carrying out an extensive highway program because it believed good roads as important as good rail lines during the world conflict.

A Special Call to Duty

By C. E. Schaff

Receiver of the Missouri, Kansas & Texas

The citizen employed in an essential industry who makes steady savings from his earnings and lends them to the government adds steadily to the Nation's power to prosecute the war.

The Liberty Loan appeal should therefore meet with special response from the men who make up the rank and file of the American railroad army. We are specially favored in the fact that while serving at home posts devoting our time and talents to the pursuits we have followed in peace, enjoying the comfort, safety and opportunity of home surroundings, we daily render vital service to the Nation in keeping open the arteries through which supplies essential to military efficiency flow to the fighting front.

From those who enjoy special opportunity for service special contributions are due. The call to all citizens to participate to the fullest extent in making the Third Liberty Loan a tremendous popular success is to the railroad rank and file a special call to duty.



Hog Island Shipbuilding Yards in Course of Construction

A Big Transportation Problem at Hog Island

Rapid Construction of World's Greatest Ship Yard Dependent on Ability to Deliver Men and Materials

ON MARCH 20 the Philadelphia Rapid Transit Company executed a contract with the Emergency Fleet Corporation for the construction of an extension from Eastwick Avenue to the Hog Island shipyard on the extension of Island Avenue, to be constructed by the City of Philadelphia, and has undertaken that it shall be in operation by July 1, 1918. The contract provides for the operation of one hundred new cars between Hog Island and the subway and elevated terminals of the Philadelphia Rapid Transit Company. The Fleet Corporation will advance funds to the transit company to the amount of the cost of the new construction and equipment, and at the close of the war this property will be taken over by the Philadelphia Rapid Transit Company at the appraised value for operation. The fares to be charged will be settled by the Public Service Commission.

On March 28 the Philadelphia Railways Company agreed to rehabilitate its line from Third Street over the Penrose Ferry Bridge and put down double tracks from there to Hog Island; the new lines are expected to be in operation in sixty days. The Street Corporation is advancing the money for the new construction work of the Railways Company, which will consist of new tracks, new power station and 25 additional cars. The cars will not be as heavy as those used on the Philadelphia streets for the reason that the Penrose Ferry Bridge cannot stand the weight; but the new cars will be larger than those now in use. The Railways Company also agrees to take over all the property at the end of the war at its appraised value.

Both of the above agreements were executed by Rear-Admiral F. T. Bowles, assistant general manager of the Emergency Fleet Corporation, who is located in Philadelphia.

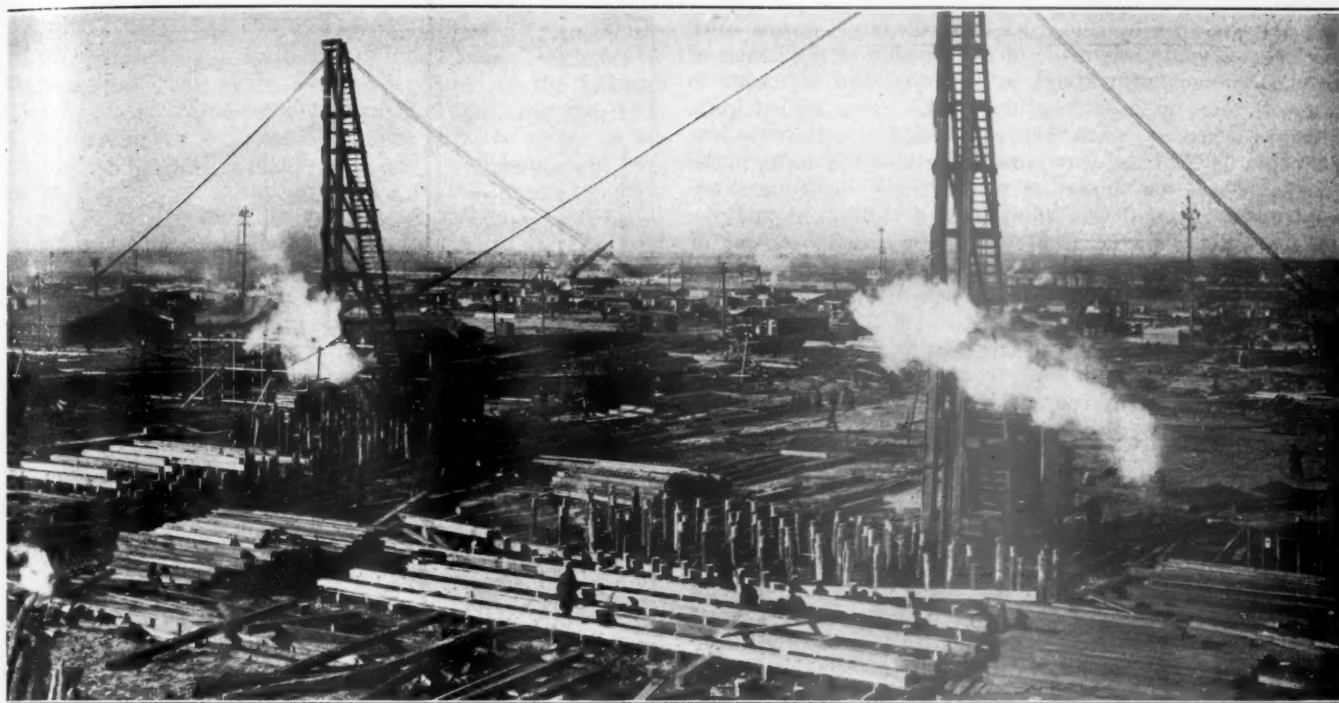
A Remarkable Feat of Transportation

Possibly it is not strange that in these days of great accomplishments, a remarkable feat of transportation, in the

very heart of the East, should have been almost overlooked, not alone by the public but by the railway world as well. In ordinary times the installation, within a few months and under extremely unfavorable circumstances, of a transportation scheme involving the building of between 70 and 80 miles of track, the furnishing of a complete railway equipment and the development of an organization to operate it would be a noteworthy task. When, in addition to this, it was necessary to secure co-operation from street railways, steam roads and steamers to carry back and forth each day, through congested freight districts and with inadequate facilities and equipment, from fifteen to twenty thousand men and to insure the delivery and handling of from 200 to 300, or even more, carloads of freight each day, the task would seem to be almost superhuman. Such was the situation which confronted the American International Shipbuilding Corporation in the construction and operation of the Hog Island ship building plant, located on the banks of the Delaware river about six miles south of the center of Philadelphia.

Almost immediately after the entrance of the United States into the war, it was realized that the issue depended on the construction of ships on a scale hitherto unthought of. It was realized that ordinary methods would not meet the emergency, and Americans naturally turned their thoughts towards quantity production of units of a single type. It was therefore necessary to break away from ordinary shipbuilding methods, and develop an organization, which would combine not only shipbuilding skill, but knowledge of the manufacturing resources of the country and ability to lay out a construction program on a really tremendous scale.

The government, therefore, through its Emergency Fleet Corporation, made a contract with the American International Corporation to build a yard, with 50 ways, so that 50 ships could be under construction at the same time. The original plan contemplated also the construction of 200 ships of a



Hog Island Shipbuilding Yards in Course of Construction

similar type to have a capacity of 7,500 tons dead weight.

The ships were to be of steel of standard construction, so that the parts would be absolutely interchangeable. In this way the thousands of different parts could be fabricated at manufacturing plants throughout the country and be rapidly assembled at a central plant. A great amount of time could thus be saved compared with the general method of building ships in which the different parts are fabricated at the shipyard and carefully and laboriously fitted into place. By concentrating on the building of a standard design in a shipyard especially constructed for this particular design, the problem would be largely to arrange for the steady supply and distribution of material, to provide special facilities for handling the work expeditiously and to supply an adequate number of properly trained workmen to assemble the parts. The parts being fabricated elsewhere would make it possible to secure a maximum output from a given size plant with a minimum amount of labor; or, in other words, an erecting plant could be designed which would, with a limited number of men, say, 30,000 or 40,000, utilize the work of several hundred thousand workers scattered in small groups throughout the country—a total force so large that it would be impossible to house and take care of it at a central point in the short time available for preparation.

The contract between the Emergency Fleet Corporation and the American International Corporation was signed on September 13, 1917, and called for the construction of the yard and fifty 11½ knot, 7,500 ton cargo vessels, each 400 feet long. A little over a month later on October 23, it was decided to build also seventy 15 knot 8,000 ton combined transport and freight vessels, each 450 feet long.

This second type required some modifications of the plans of the yard, as will be noted hereafter, but did not greatly, if at all, delay the work, though it did materially increase the cost of the yard.

To build these ships will require a steady force of about 30,000 men; 25 acres of covered buildings; 50 shipways, each 500 ft. long; and 7 outfitting piers, each 1,000 ft. long. Each outfitting pier or wet basin will accommodate 4 ships so that 28 ships may be fitted out at one time. In the neighborhood of 1,000 shops throughout the country, employing over 300,000 people, will build the various parts. For in-

stance, 75,000,000 ft. of lumber will be required, 400,000 tons of steel, 40,000,000 rivets, 570 boilers, and over half a million horse power of turbines.

Hog Island at the time of the awarding of the contract was a rough desert, thickly overgrown with underbrush. The island is two miles long, a mile wide and contains 900 acres. There were no freight or passenger lines reaching it, and the nearest approach by trolley was a mile and a half distant. The only way in which one could travel about the island was on horseback and there was no water supply and no source of power. The problem which confronted the shipbuilding company was to build and get into operation in a few months a shipyard which would have to build ships on a larger scale and at a greater speed than ever before attempted. Remember too, that this was at a time when the freight congestion was acute, construction materials were scarce, and skilled or unskilled labor almost impossible to get. The contract was let late in the fall and it was necessary to carry it on at high speed throughout the coldest and most severe winter that has been experienced for years. When the contract was signed, no surveys had been made nor were any but general sketch plans of the layout available. Plans were developed, and surveys and office work pushed to such an extent that construction was under way by the middle of October.

Difficulties Encountered

The difficulties under which it was necessary to build up the transportation system may be realized to some extent when it is known that in some cases angle bolts for the track were put on by using ordinary monkey wrenches with the nuts 8 or 10 inches below the water. Under normal conditions, a contractor would not attempt for a moment to put through a big project such as the Hog Island shipbuilding yard in cold or unfavorable weather and yet it was necessary to do so in this case in spite of the fact that the ground during mid-winter was frozen several feet deep and had to be dynamited in order to lay the water pipes and wire conduits; it had to be steamed out before the piles could be driven. About 120,000 piles will be required for the completed plant; most of these being already driven.

When the work was first started, it was necessary to build a road 1½ miles long to the nearest avenue and to bring

materials and men by auto truck from the city. As the work developed, a study was made of the location of the homes of the class of men who would be employed and of means to transport them to and from the work. The Philadelphia Railways Company, when the work started, was the only line that could be used and it required a walk of $1\frac{1}{2}$ miles to the island. This line, however, was entirely inadequate because of its physical condition, lack of equipment and the fact that only a single track could be operated over one of its bridges. By the end of September, 2,000 men were employed on the island and it proved necessary to call on the steam roads for help in spite of the fact that it would necessitate operating the trains through badly congested freight terminals.

The railroads finally consented to operate one train out of the Pennsylvania station at Broad and Washington Streets and one from the Philadelphia & Reading station at 31st Street and Girard Avenue. These ran over the Chester branch of the Philadelphia & Reading to North Essington and back over the Pennsylvania to a point near Hog Island. The Pennsylvania track was part of a branch being built by the P. B. & W. to Hog Island and connecting with the main line at Eddystone. The trains were operated with great difficulty because of the crowded condition of the Baltimore & Ohio tracks over which it was necessary to run for a short distance because the Chester branch was single track and because of the Pennsylvania branch to Hog Island being only partially completed. The arrangements for handling of trains at North Essington were also poor and the workmen were greatly discouraged by the loss of time and the poor service.

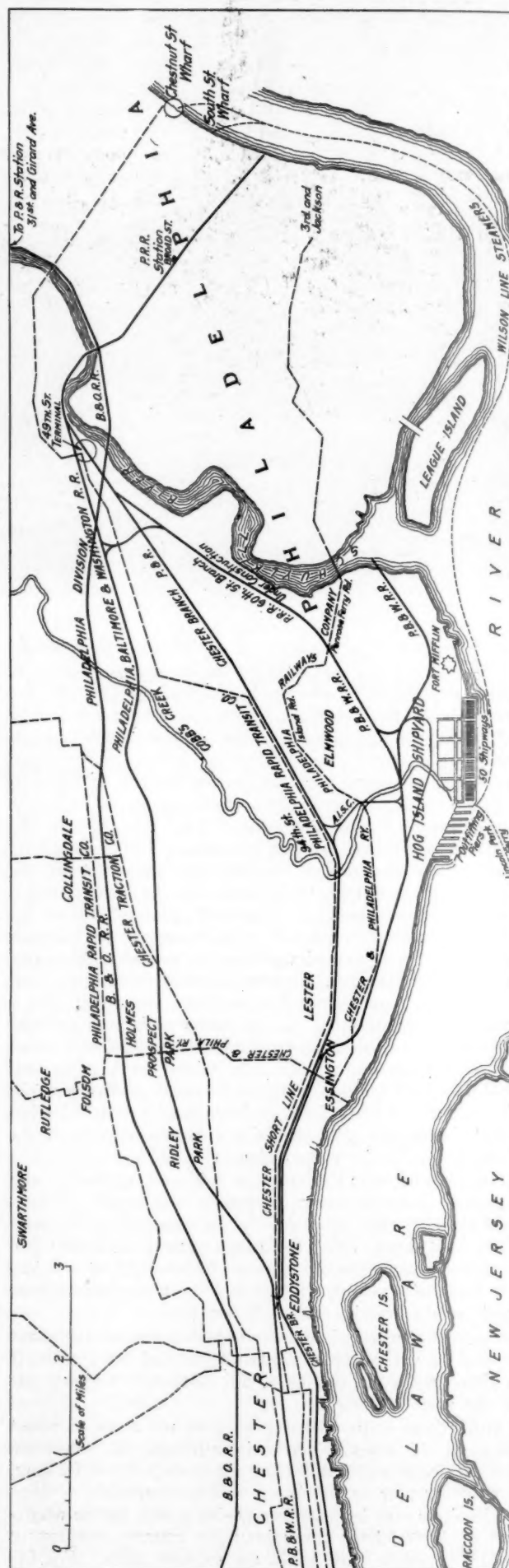
To meet this critical situation, the American International Shipbuilding Corporation built a track $1\frac{3}{4}$ mi. long from Hog Island to the Chester branch at 94th Street, over which the trains from the city could be operated and run to the center of the plant and over which shuttle trains were run to carry the passengers which came to 94th St. on the street cars. Meanwhile, the street car lines took measures to improve their service.

The transportation facilities still being inadequate, water service was investigated and arrangements were made with the Wilson Line to operate one of its steamers from the Chestnut street wharf—a run of about 40 min. Soon a second and later a third boat was added. Three boats being all the Wilson Line could spare, additional boats were leased at a high cost. Boats were also chartered for ferry service to Billingsport on the Jersey side of the river.

Additional trains were steadily added to the steam lines until five trains are now run out of the Broad and Washington street station, three from Girard avenue and two from 49th street on the Philadelphia & Reading. The extreme weather this winter interfered to a greater or less extent with the schedules on the steam and electric roads, and for the first time in 37 years it was impossible for steamers to operate in the Delaware river, operation being discontinued for a period of about ten days. Operation on the P. & R. has been greatly improved by the double tracking of that line and the P. B. & W. has under construction a line from Hog Island to 60th street which will add greatly to the present facilities.

Barracks have been erected at Hog Island which will house 6,000 men. In addition to this, the city of Philadelphia is working on a housing plan to provide for several thousand workmen within a couple of miles north of Hog Island. The facilities, however, will be crowded to the limit when the plant is completed and a full force is at work building ships; more than 30,000 men will then be required.

Material is brought in over the P. B. & W. branch which connects with the main line at Eddystone. Great difficulties were experienced in the earlier stages of the work, but the intra-plant system, supplemented by better roads and motor trucks, has solved most of the difficulties.



Map of Philadelphia and Vicinity Showing Transportation Lines to the Hog Island Shipyards

Intra-Plant Transportation

The Pennsylvania Railroad (Philadelphia, Baltimore & Washington) runs along the northern side of the island.* The passenger trains coming from the north over the A. I. S. C. shuttle line unload at a station near the center of the plant. At the west end of the yard are inbound and outbound interchange yards. Alongside of the inbound yard is a classification yard. The inbound interchange yard has a capacity for 282 cars; the outbound a capacity for 252; and the classification yard a capacity for 346 cars.

Two material storage yards have been provided; one for the 7,500-ton vessels, and the other for the 8,000-ton vessels. These are arranged in such a way that definite locations are specified for each piece of material. There are at least 20,000 important parts required on each ship so that the planning of the storage yard and facilities was no small task. The material yards have a capacity for a two-weeks' supply of parts. The material storage spaces are separated by groups of three tracks with single tracks alternating. The single track is used by 85-ton Brownhoist cranes, with sufficient reach (50 ft.) to unload the cars on the opposite sides of the material spaces. The loaded cars are placed on the two outside tracks in each set of three tracks; the middle track, with its cross-overs being used to pull out cars which have been unloaded, or which it is necessary to place elsewhere.

Some 30,000 tons of material will have to be handled weekly at the time of maximum production—five ships per week—besides the coal, lumber, commissary supplies, etc., for the operation of the yard.

This material comes from a thousand different sources, and while some of the manufacturers can deliver parts for 5 or 10 ships at a time, some can only arrange to make and deliver not less than the whole quota of 50 or 100 parts. The material storage yards, therefore, act as storage reservoirs to hold the material as it is received, and facilitate its distribution to the ships.

At the eastern end of the yard is what is known as a holding yard. Every day such material as may be required for use at the shipways on the following day is loaded on flat cars in the material storage yards and placed in the holding yard until it is needed. From the holding yard it can easily be switched to any one of the shipways. South of one of the material storage yards near the center of the plant are a number of warehouses in which material is stored which cannot safely be left in the open. A track extends to each one of these warehouses so that at the proper time the material may be loaded and sent either to the holding yard or to the shipways. The small shops directly back of the shipways and between this material storage yard and the holding yard are not provided for the fabrication of material but more or less as an emergency measure to take care of any work that may have to be done in the way of modifications to parts or repairs. In other words, they are largely an insurance against delay. A small holding yard is also provided for at the western end of the plant for cars containing material that is to be stored in the warehouses back of the wet basins or which is to be delivered direct to the piers alongside of the wet basins.

At the west end of the yard are the receiving and despatching yards for inbound and outbound cars from, and to, the Pennsylvania Railroad. From the inbound yard, the cars are classified and then distributed to the material yards and warehouses, where they are unloaded and returned to the outbound yard. The distribution from the material yards and warehouses through the holding yard to the ships, is done with the yard equipment. It is expected therefore that the railroad cars will be held for the minimum possible length of time.

An interesting feature of the yard layout is the provision

*It is regretted that the censor asked that the detail map which accompanied this article be left out.

of a double set of thoroughfare tracks, throughout the yard, two tracks in each direction. Ample provision for both storage and against delay in moving from one part of the yard to the other, is absolutely necessary in order to secure the necessary continuity of operation. The schedule of construction is so laid out that any break in the supply of materials will tend to more or less serious disorganization, so that ample provision to guard against this is an absolute necessity and has very largely controlled the design of the yard.

It was thought at first that some of the trackage provided might not be absolutely necessary, but in view of the seriousness of delay, either in case of an insufficient stock of parts on hand or in distributing them to the ships, much more ample facilities will be required than would be necessary under ordinary conditions.

There are 50 shipways arranged in 5 groups of 10 each and extending one mile along the water front. The first keel was laid about the middle of February and it is estimated that 25 of the ships will be ready for delivery about the first of November of this year. One ship will be delivered for every two days during the 8½ months following the delivery of the first ships; at the time of maximum production it is expected that 5 ships will be launched each week.

During the construction period it was necessary to have 22 locomotives in service; several of these being leased. The final equipment will include 14 locomotives, of which three are heavy six-wheel switching locomotives for use in the classification yard. These are being built by the Lima Locomotive Works. They weigh 170,000 lb., have 57 in. drivers, carry 180 lb. of steam and have 21 x 28 in. cylinders. The permanent equipment will also include four eight-wheel passenger locomotives, three saddle tank locomotives and four six-wheel switchers.

Automatic signals are provided and an interlocking plant has been placed at the intersection with the Pennsylvania Railroad. The rolling stock equipment consists of 20 passenger coaches, which were purchased from the Central Railroad of New Jersey, 300—30-ton, flat cars, 100 new 50-ton flat cars and 50—40-ton box cars. The passenger coaches are used for shuttle service. At present these shuttle trains are making the round trip in 25 minutes but another train is about to be added and the trains will be operated under a 5 min. headway. The passenger yard at West 4th street has a capacity for 125 to 130 coaches with facilities for cleaning and maintaining them. The engine house to the west of this yard has a capacity for twelve engines at one time and is equipped with small tools for making running repairs.

The following table shows the extent of the track facilities.

| FREIGHT LINES | | |
|--|----------------|-----------|
| | Miles of track | Turn outs |
| Interchange yards—inbound | 3.86 | 18 |
| Interchange yards—outbound | 3.35 | 15 |
| Main classification yards | 6.68 | 48 |
| Hauling yard | 3.05 | 19 |
| Shipways warehouse tracks | 1.88 | 12 |
| Shipways tracks | 13.87 | 59 |
| Wet basin warehouse tracks | 0.82 | 6 |
| Wet basin pier tracks | 11.24 | 81 |
| Wet basin sentry tracks | 2.65 | ... |
| Machine shop tracks | 1.28 | 6 |
| Engine yard | 2.24 | 20 |
| Coach yard | 2.11 | 9 |
| School shipyard | 0.41 | 3 |
| Total mileage of freight line tracks | 77.4 | ... |
| Total number of freight line turn-outs | ... | 488 |
| PASSENGER LINES | | |
| | Miles of track | Turn outs |
| Shuttle line, So. of P. R. R., double track throughout | 6.08 | 22 |
| All track is of standard gage 85 lb. A. S. C. E. rail; ballast 6 in. below ties. | | |

While the road is not a very large one, it will operate under intense conditions and will probably have to live up to the size of its name: U. S.-E. F. C.-A. I. S. C. In other words, the equipment is in the service of the U. S. Government through the Emergency Fleet Corporation and the American International Shipbuilding Corporation.

"They Shall Not Pass"

By A. L. Humphrey

President, Union Switch & Signal Company; Vice-President & General Manager, Westinghouse Air Brake Company; President, Employers' Association of Pittsburgh.

These are days that try men's souls and afford a supreme test of the Nation's resourcefulness, loyalty and patriotism. At this writing the enemy's guns are hammering at the very gate-ways of Calais. Haig's valiant army is fighting with its back to the wall. The Hun hordes, drunken with lust and power, and with reckless disregard of human sacrifices, are pushing back the forces of civilization at practically every point on the Western Front. It is indeed a solemn hour for the friends of Liberty.

Optimism is a characteristic of the American people and is a quality of mind that has grown on us with the expansion of our population and with the increase in our industrial and material resources. It has as its basis also our fancied security from foreign aggression, and the historical fact that our flag has never gone down to defeat. Just the same, it behooves us to recognize that we are threatened by the most formidable foe of all times, one that in all history has not been surpassed in diabolical ingenuity and cunning and who is ready and willing to stake his all on the triumph of autocracy over democracy, of force over decency and justice. I do not want to be considered an alarmist or pessimist, but, at the same time, we might as well look the facts squarely in the face, and if my note of warning does nothing else than bring home to a single lethargic person the serious situation that would confront the Allies in case the battles of Picardy and Flanders went against them, I shall consider these words as not having been written in vain.

Those of us who live in security in the United States and comprise what may be termed the "third line of defense" will have to adopt the slogan of the gallant Frenchmen: "They shall not pass," and do all we possibly can, in our limited way, to back the boys in the front line, morally and financially. At the moment there is no better way to do this than to buy Liberty Bonds. Don't let us buy them perfunctorily, but in a "win the war spirit," which calls for actual sacrifice and hardship.

In this era of rapid transit we have learned to look upon the steam railroads of the world as a potent factor in the conduct of the war, and it is hardly necessary for me to dwell upon the splendid, the magnificent support given the Federal Administration by the American railroads, from the highest official down to the laborer on the track. Unselfish devotion to duty is the order of the day, and if their purchases of Liberty Bonds of the preceding series can be taken as a criterion, they will surely "go over the top" in the present campaign with flying colors.

Closely identified with and vital to the railroads of the country, the railway supply manufacturers are giving and will continue to give the best that is in them towards a successful prosecution of the war. Seriously crippled in man power, thousands of their employees having joined the military forces of the United States and of our Allies, the manufacturers may not be able always to render the high grade

service heretofore the rule. They ask the railroads to bear in mind the difficulties the railway supply manufacturers, in common with all other interests, are laboring under and that we are doing our utmost to keep the wheels going around and backing up those who are fighting our battles at the Front.

Speaking especially of conditions in large manufacturing plants of Greater Pittsburgh, I know from personal experience that in connection with the Third Liberty Loan campaign it is not a question of whether the quota is going to be subscribed, but rather, whether it is going to be doubled or trebled. The apathy in certain quarters which characterized the first campaign has given way to unbounded enthusiasm, and if shipments get somewhat behind in the next few weeks, it will be because every workman has temporarily left his workbench and constituted himself a committee of one to make the Third Loan a huge success.

Appropos of the resolution passed at the last annual meeting of the Railway Business Association to ask the Director General of Railways to designate April 20th as "Railway and Railway Materials Manufacturers' Liberty Loan Day," permit me to call the attention of those concerned to the patriotic and wonderfully effective work done by the so-called Liberty Loan Loyal Legion, which has for its purpose the promotion of loyalty among the subscribers to Liberty Bonds, teaching the value of the bonds as an investment and obtaining pledges from the purchasers that they will not offer government securities for sale at less than par and interest, until three months after peace has been declared. The pledge exacted from members is as follows:

"I, the undersigned, as Subscriber to the Liberty Loan, hereby solemnly pledge my word and honor not to offer for sale any bonds or other evidences of indebtedness of the United States owned by me, at less than par and interest, except in case of extreme necessity, until three months after peace has been declared."

On February 7, 1918, Liberty Loan Loyal Legion No. 1 was formed in one of the large railway supply plants of the Pittsburgh district and four-minute men were recruited from the shop to give impetus to the movement. Today Legion No. 1 boasts practically 100 per cent membership and has become the nucleus of dozens of similar organizations throughout the Greater Pittsburgh district. May I not then, by way of a message to fellow members of the supply fraternity, urge the formation among their employees of Liberty Loan Loyal Legions throughout the length and breadth of this land? Once duly organized and in working condition, the Legions are certain to give a splendid account of themselves and will work wonders not only in the encouragement of thrift and Liberty Bond purchases, but also in the promotion of loyalty and the "will to win the war."

Kultur—Bar its progress with Liberty Bonds.

Doings of the United States Railroad Administration

Coastwise Steamships Taken; Comprehensive Statistical Studies to Be Made; Police Meet

Government Takes Over Coastwise Steamship Lines

PRESIDENT WILSON on April 11 issued a proclamation taking over for the government the property of the Clyde Steamship Company, the Mallory Steamship Company, the Merchants' & Miners' Transportation Company, and the Southern Steamship Company, which operate 63 vessels in coastwise service. The steamship lines owned by railroad companies had already been taken over under the proclamation by which the government assumed control of the railroads. The President, in his proclamation, also directs that the control and utilization of the steamship lines shall be exercised through William G. McAdoo, director general of railroads, who may perform the duties, so long and to such extent as he shall determine, through the boards of directors, officers and employees of the companies. The proclamation is similar to that under which the railroads were taken over and provides that the director general shall enter upon negotiations with the companies looking to agreements for compensation for the use of the properties. The government's operation became effective on April 13.

In General Order No. 19 the director general announces that pursuant to the proclamation of the President he has taken possession and assumed control of the steamship companies named, and until further order it is directed that all of their officers, agents and employees shall continue in the performance of their present regular duties, reporting to the same officers as heretofore, and on the same terms of employment; and that any officer, agent or employee desiring to retire from his employment shall give the usual and seasonable notice to the proper officer, to the end that there may be neither any interruption nor impairment of the service.

For the administration of the coastwise steamship lines the Coastwise Steamship Advisory Committee has been created, as announced in Circular No. 23, with office at 165 Broadway, New York City. L. J. Spence, director of traffic of the Southern Pacific, is appointed chairman with authority to form the committee from the officers of the following steamship lines: Clyde, Mallory, Merchants' & Miners', Ocean, Old Dominion, Southern Pacific, and Southern.

The chairman of the Coastwise Steamship Advisory Committee will report to the manager of the Marine Section of the Division of Transportation and will exercise supervision

over all coastwise lines under control of the United States Railroad Administration.

Wage-Adjustment Board

Railway Board of Adjustment No. 1, which is to adjust controversies between railroad companies and members of the trainmen's brotherhoods, has organized by electing Charles P. Neill, manager of the Bureau of Information of the southeastern railroads, as chairman, and L. E. Shepard, vice-president of the Order of Railway Conductors, as vice-chairman. The board is now ready for the transaction of such business as may come before it, as provided in General Order No. 13. Circular No. 22 issued by the director general directs that every case submitted, except the unfinished business of the Commission of Eight, which is transferred to this board, should be accompanied by evidence that its submission is approved by the chief operating officer of the railroad upon which the controversy has arisen, and by the chief executive officer of the labor organization concerned. Where two or more organizations are jointly concerned, the submission should be joint, if practicable.

Article 11 expressly precludes a consideration by this Board of any matter unless officially referred to it in the manner prescribed in the memorandum of understanding.

Article 14 requires that in each case an effort should be made to present a joint concrete statement of facts as to any controversy. Statements of fact, whether joint or separate, should be sufficiently

comprehensive to give an understanding of the controversy that the board is called upon to decide. Where briefs, or additional evidence, are to follow, notice thereof should accompany the submission. Where additional matter is to follow the submission, the case will not be transmitted to the Board of Adjustment by the Division of Labor until the additional data shall have been received.

Monthly Statistics Called For

It is requested that three copies of the joint concrete statement be filed with the Division of Labor for matter of record and for the information of the board. Briefs and documentary evidence need not be furnished in duplicate, but whenever possible, should be attached to the three copies of the joint statement.

The Railroad Administration has taken steps to secure

Let Us All "Go Broke" Buying Liberty Bonds

By Frederick D. Underwood

President of the Erie Railroad, and Chairman of the Liberty Loan Committee, Eastern Regional District

To me it seems redundant to send to anyone exhortations to buy Liberty Bonds. The billboards, the daily papers, the moving pictures, and every other means of reaching the public, are charged with exhortations to that end. All of the invitations are good. Some of them should be preserved. This morning I noticed two in particular: "Come across, or the Kaiser will" and "If you can't shoot, buy Liberty Bonds."

It devolves on the railway fraternity to back up their fellows in France. The railway and engineering professions are almost in a class by themselves, in that they have recruited battalions. We owe it to our fellows abroad—and I am sure we will pay the debt, and without this reminder—to see that so far as money will buy the things they need, and crave beyond their needs, they are furnished them in abundance.

The rank and file of railroad men are free spenders, generous to a fault. Let us all further indulge our propensities in this direction, and for once feel proud of it. Let us all "go broke" for the time being in buying Liberty Bonds. Aside from doing our brothers good, we are doing ourselves good. The feeling of satisfaction from making a good sound investment is a thrill worth getting.

through the regional directors information on the performances of individual carriers to enable comparisons between railroad operation under government and under private control. Orders have been issued by the regional directors that monthly reports be sent to the director of transportation, including (a) detailed income reports showing comparisons with the previous year and indicating the expenses by primary accounts; (b) each report or statement used by transportation officers to measure efficiency and cost of operation; (c) reports used to measure efficiency and cost of locomotive performance, also (d) usual explanations provided for president or chief operating officer covering increases or decreases as shown in the above-mentioned statement.

Meeting of Railroad Police Officers

Chief special agents of some of the principal railroads of the country held a conference last week with P. J. Doherty, manager of the Section of the Railroad Administration which deals with the Protection of Railroad Property, with a view to co-operation in the work of theft-prevention at railroad yards and terminals. An advisory committee was selected, to co-operate with the representative of the Railroad Administration, consisting of Chief Special Agents J. W. Connelly of the Southern, W. G. Baldwin of the Norfolk & Western, T. T. Keliber of the Illinois Central, R. S. Mitchell of the Missouri Pacific, and J. R. McMahon of the New York, New Haven & Hartford.

Locomotive Service Data

Information with respect to locomotives and locomotive performances for the year ended December 31 and for the three months ended March 31 is called for from all railroads under federal control. This is by Circular D. C. E. No. 5, issued by R. S. Lovett, director of the division of capital expenditures, which asks for the number, weight and tractive capacity of locomotives owned or leased; number of serviceable locomotives, number contracted for and undelivered; locomotive miles in transportation and work train service, gross and net ton miles of revenue and non-revenue freight; pounds of tractive power available per 1,000 locomotive miles, per 1,000 gross ton miles and per 1,000 net ton miles.

The Short Lines

Officers of the short line railroads are greatly concerned because of the attitude of the Railroad Administration in its interpretation of sections of the railroad control law regarding the lines to be taken over by the federal govern-

ment. Section 1 provides that every railroad not owned, controlled or operated by another carrier company and which has heretofore competed for traffic with a railroad or railroads of which the President has taken the possession, or which connects with such railroads and is engaged as a common carrier in general transportation, shall be held and considered as within the federal control. Section 14 of the law, however, contains a provision that the President may, prior to July 1, 1918, relinquish control of all or part of any railroad system of transportation, further control of which shall be deemed not needful or desirable.

The short lines had protested vigorously against the attitude taken by the Railroad Administration prior to the passage of the law, that many short lines would not be considered necessary and therefore would be excluded. These railroads declared that they would be placed in a serious condition if they were excluded. They were apparently satisfied with the provision of the law as it was enacted; but they have since learned that the Railroad Administration apparently does not intend to exercise jurisdiction over some of the smaller roads until the question as to whether they shall be retained under federal control after July 1 shall have been determined. Representatives of the short lines attended a meeting in Washington on April 11 and 12 at the call of the American Short Line Railroad Association, and they held a conference with John Barton Payne, general counsel of the Railroad Administration, on the subject. Many short lines have been released, both before and since the passage of the law, at their own request, but most of the officers of short lines take the position that all should be included under federal control and that that was the intention of Congress. Some of them say that if they are not to be included in the federal system their tracks should be taken up and operation abandoned; but they foresee difficulties

with state laws and state commissions in any attempt to do so. It is possible that a plan may be worked out by which the Railroad Administration can take over certain lines and then order their tracks taken up.

The decision of the Railroad Administration as to its course toward the short lines will be based mainly on information secured by the regional directors from the trunk lines in their territory; but the short railroad lines have been told that no line will be excluded without a hearing.

In order to insure that coal mines may be operated to capacity and to provide a store of coal for the winter months, R. H. Aishton, regional director of western roads, has re-

"As Sound As the Rock of Gibraltar"

By R. H. Aishton

President of the Chicago & North Western, and Regional Director of Western Railroads.

The government in floating the Third Liberty Loan is giving us all another opportunity to be of further service to the nation in the great and righteous cause we are fighting for. Every railroad officer and employee is now striving energetically for the government by satisfactorily and efficiently carrying out their duties in their line of work, in order that the transportation systems may successfully perform their part—and it is a large part—of the burdens that the nation is being called upon to face.

However, there is still a further duty that each railroad officer and employee owes to his country at this time and that is from the standpoint of a patriotic American citizen; namely, to preserve our great country inviolate from any invasion of a foreign foe, and to assist in the prosecution of the noble work now being carried on by our boys across the water, and to the end that those who have died fighting for our liberty, side by side with their British, French and Italian comrades and Allies, should not have died in vain, and to provide them with arms, ammunition and food.

We, who are left behind here at home, should each, individually, feel it our duty to subscribe to these bonds, which without a doubt, are the safest investment on earth, for the reason that they are safeguards of the future of the greatest nation in the world. It is indeed a privilege, as well as an act of wisdom, to put our money into an investment at an excellent rate of interest, when we know that this investment is as sound as the "Rock of Gibraltar."

Let us all, both officers and employees, without exception, stand shoulder to shoulder on this side, as are our boys on the other side, and subscribe to the greatest extent of our ability.

quested the lines under his jurisdiction to use coal cars only for coal traffic, except that they may be loaded locally in the direction of the nearest junction point of the owning line, or in the direction of the mines on the owner road, or to a destination on the owning line, provided that immediate loading is available. Cars must not be back-hauled to obtain loading. If it is found that loading coal cars in the homeward direction delay them to the extent that it is impossible to fulfill all requirements for coal loading, instructions will be issued to return the cars empty.

Recent Orders of Western Regional Director

In another communication Mr. Aishton points out that the movement of perishable freight from southeastern states is increasing rapidly and that every effort should be made to return promptly all ventilated cars belonging to roads in that territory.

The western regional director is taking steps to eliminate the service of one road where there is duplicate local freight service on lines jointly operated. Up to date, such reductions in service have resulted in a monthly saving of 8,080 train-miles.

All western lines have been asked to supply accurate information in detail concerning reductions in passenger train mileage (1) between June, 1917, and December 28, 1917, and (2) from December 29, 1917, to March 31, 1918. They are also requested to advise the regional director of western roads of further passenger train mileage which can be eliminated, having in view the operation of all roads as one system.

Plan to Expedite Oil Movement

Because of complaints that soldiers and sailors have been overcharged by railroad news agents and in hotels and lunch rooms, the lines in western territory have been requested to take steps to insure the discontinuance of this practice so far as it is within their control.

At a meeting between representatives of the railroads, the mid-continental oil interests and the United States Fuel Administration at the office of the regional director of western railroads on April 2 the importance of prompt movement of oil was given full consideration. It was disclosed that there has been a considerable reduction in the number of tank steamers available for the movement of oil from southern ports to the Atlantic seaboard. This condition, as well as a heavy increase in the consumption of oil by the government and various manufacturing plants engaged in war work, has greatly increased the demand for tank cars. In addition,

the oil producers are being urgently pressed by the government to make every effort to increase their output. Owing to the shortage of material and delays in deliveries it will not be possible to make any considerable additions to the available supply of tank cars in the near future. The only solution of the problem is the strictest economy on the part of all concerned in the use of tank cars.

To bring about the closest co-operation between all interested it was thought advisable

that a representative of the regional director of western railroads be appointed to be associated with the representatives of the United States Fuel Administration and the oil interests in the so-called mid-continental field. To this end, B. L. Swearingen, assistant freight agent of the Missouri Pacific, was appointed supervisor of oil traffic, with headquarters at Kansas City, Mo., as mentioned in the *Railway Age* of April 12, page 1006. He will arrange to concentrate the oil movement so far as possible in trainload lots which will be moved intact via one destination or distributing center. The oil producers have agreed to discourage the reconsignment of oil, which is now the cause of considerable delay, to cars and will impress upon all receivers of oil the necessity for providing additional storage capacity to insure prompt unloading and a supply of oil for use during times of traffic interruption by winter weather or otherwise. The railroads have been requested to arrange for a systematic daily service for the return of tank cars and in solid trains, so far as is practicable, to distributing centers.

BRITISH PRISONERS ARE WORKING ON LIGHT RAILWAYS within six miles of the front, according to a correspondent of the Philadelphia Public Ledger.

BRITISH WRECK MEDINA RAILWAY.—British mounted troops have destroyed several miles of the track of the Hedjaz Railway, east of the River Jordan, on the Palestine border,

it was officially announced in London on March 30. The cutting of the Hedjaz Railway line severs the communication of the Turks with any of their forces that may be in the region southeast of the Dead Sea and with those in Western Arabia. The revolting Arabs in the Hedjaz district have been masters of the lower part of this railway for some time, but the destruction of the line at this far more northerly point will, it seems probable, prove a far more serious blow to the Turks. The only rail route to Medina, just to the north of Mecca, the Mahometan shrine, is also destroyed by this blow.

Back Up the Boys "Over There"

To Railway Officers and Employees of the Western Regional District

By W. G. Bied

President of the Chicago & Alton, and Chairman of the Railroad Liberty Loan Campaign Committee, Western Regional District

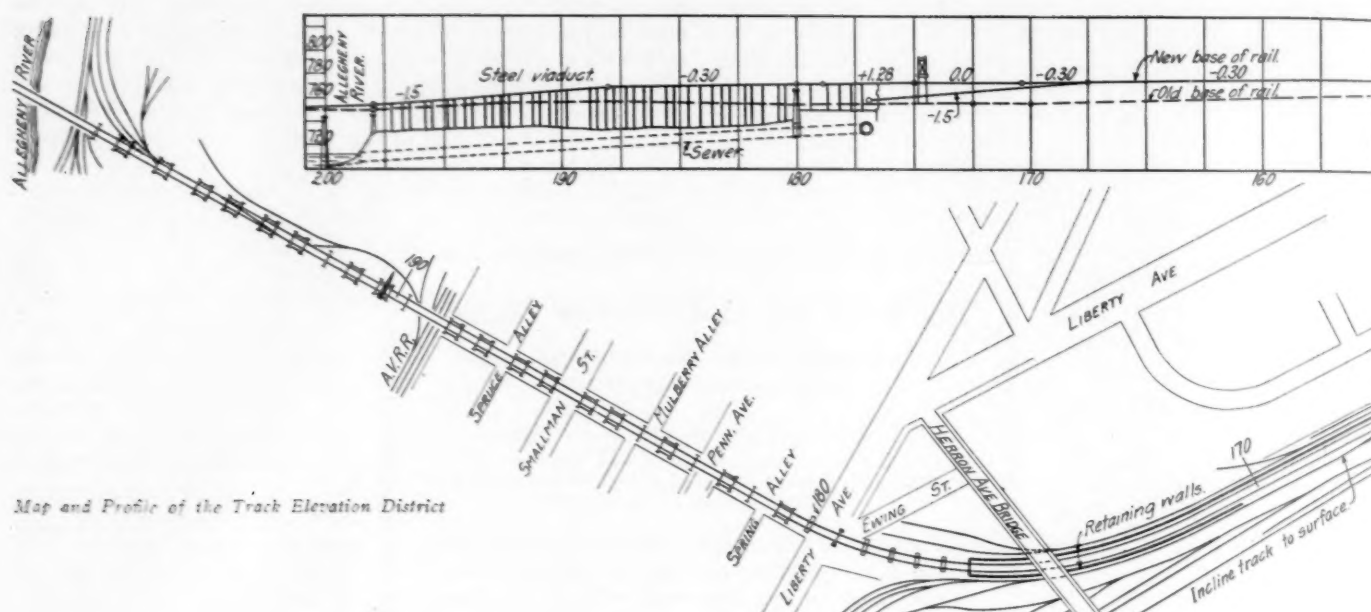
A crisis has come in the war which the United States and its Allies are waging for the highest ideals of humanity. Our very existence as a nation of freedom and liberty-loving people is at stake. We must win this war, no matter what the cost.

Those who are fighting "over there" must be maintained by the money of those who must stay here. This is why the government of the United States is offering Third Liberty Loan bonds with interest at 4¼ per cent per year, on the best security in the world today.

In this crisis it is the patriotic duty of every American citizen to subscribe to this bond issue to the full extent of his ability. The Director General of Railroads has approved a plan whereby those in railway service are offered easier terms of payment than any other class of citizens.

In the Western Regional District there are in round numbers 800,000 railroad officers and employees whose yearly wages amount to \$850,000,000 a year. It is anticipated that a large share of a general wage increase impending will be devoted to the purchase of Third Liberty Loan bonds.

There are over 70,000 American railway men fighting in France today in this war for Freedom. They are offering a supreme sacrifice of life for their ideals, for their country, its people and its institutions. They and those fighting with them will not fail for lack of the financial support of the railway officers and employees at home. Everyone in the Western Regional District will be personally solicited to subscribe to this Liberty Loan. The response will be another demonstration of the unfailing loyalty and patriotism of the railway forces of the nation.



Map and Profile of the Track Elevation District

Baltimore & Ohio Grade Separation at Pittsburgh

The Main Tracks Are Raised on an Earth Fill and Steel Viaduct for More Than a Mile

WORKING THROUGH A DISTRICT subjected to a very heavy traffic and with the work complicated by the reconstruction at a new grade of a double-track steel viaduct, approximately one-half mile long, in a space so constricted as to make necessary the use of special construction equipment, the Pittsburgh Junction Railway, a subsidiary of the Baltimore & Ohio System, recently completed a grade separation project at Liberty avenue, Pittsburgh, Pa., which involved the expenditure of more than \$750,000. The work consisted of the elevation of the main line tracks from a point 4,150 ft. east of Liberty avenue to the east end of the railroad bridge over the Allegheny river, a distance of more than a mile. From the east end of the improvement to a point 350 ft. east of Liberty avenue, a distance of 3,800 ft., the tracks were raised on a fill supported by concrete retaining walls, while from Liberty avenue west they were raised on a steel viaduct which replaced an existing structure.

Reasons for the Improvement

The improvement was made primarily to renew the old steel viaduct west of Liberty avenue, which, if rebuilt at the old grade, would have committed the railroad for many years to come to the objectionable features of the old layout which can be best pointed out by a description of the old line.

Within the district affected by the improvement the old line occupied a private right of way from the eastern limits to Liberty avenue where it entered Thirty-third street, on which it continued to the river. East of Liberty avenue the line was built on earth cuts and fills, while west of Liberty avenue it was carried on a steel viaduct. The line involved excessive grades and curvature. Again, beginning at the east the grade descended from the level of the Pennsylvania Railroad crossing to a crossing at grade with Liberty avenue on grades ranging from 1.45 per cent to 0.06 per cent. Leaving Liberty avenue an ascending grade of 0.35 per cent was encountered for 800 ft.; then a level stretch for 200 ft., before descending on a 0.58 per cent grade to the level of

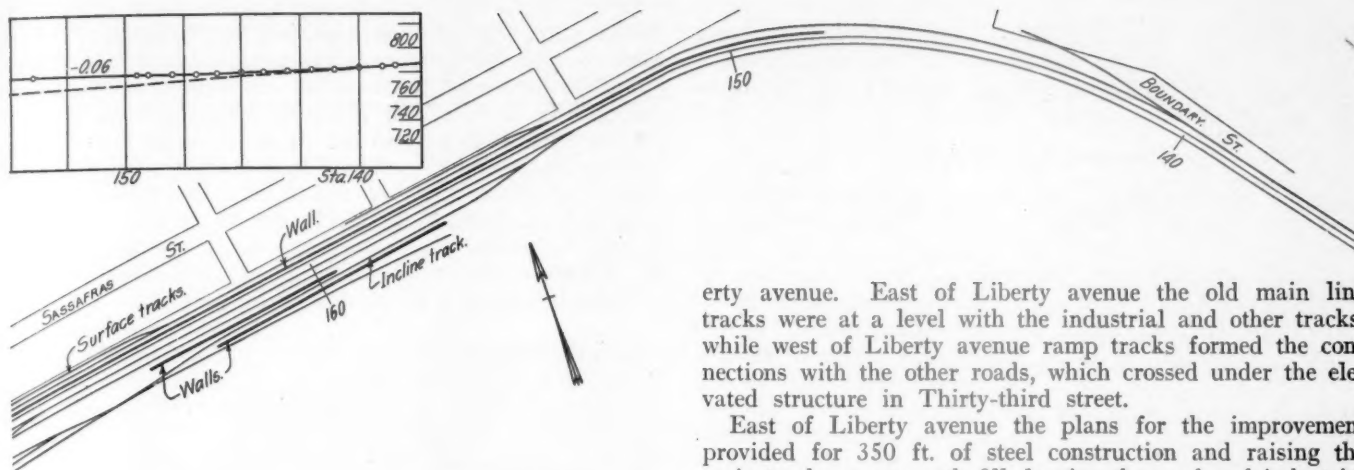
the Allegheny river bridge. The line also involved a 9 deg. and 30 min. curve across Liberty avenue.

East of Liberty avenue the only intersecting street, Forfar street, was carried over the tracks by means of the so-called Herron avenue bridge, while west of Liberty avenue all intersecting streets crossed under the elevated structure. Liberty avenue which crossed the railroad at grade with the tracks is the most important of any of the streets in the locality and one of the most important thoroughfares of the entire city, being the direct route from the center of the city to the Bloomfield and east end districts. At its intersection with the railroad it carries a double-track trolley line. The double-track main line of the railroad which crosses Liberty



Specially Designed Trestle Bents at the Carnegie Tracks

avenue carries all through freight and passenger traffic east and westbound between Pittsburgh and Youngstown, Akron, Cleveland, Chicago and all other points on the line west of Pittsburgh. For a 24-hr. period a traffic record taken for



one day showed 64 engines with trains and 41 light engines as passing over the crossing. During the same period 4,092 pedestrians, 1,703 vehicles and 358 street cars crossed the tracks.

By constructing the steel viaduct at a grade 7 ft. higher than the old one at the point of greatest change, it was pos-



A Section of the Retaining Wall

sible to eliminate the dangerous grade crossing at Liberty avenue, and secure an improved grade line for the entire distance. The plans were made accordingly. These plans also provided for a change in alignment to secure a better location for the main tracks and for the substitution of a 6 deg. 30 min. curve across Liberty avenue for the 9 deg. 30 min. curve in the old location. As built, the project involved 50,000 cu. yd. of fill, 50,000 lin. ft. of concrete piling, 25,000 cu. yd. of concrete and the erection of 4,000 tons of steel.

Unusual Conditions Encountered

In the district affected by the improvements numerous industrial plants join the right-of-way. A gantry yard also adjoins the main line just east of Liberty avenue. Interchange tracks were in service between the Pittsburgh Junction main line tracks and the Pennsylvania Railroad east of Liberty avenue and connection tracks with the Allegheny Valley Railroad, a part of the Pennsylvania system, and the river line of the Pittsburgh Junction Railroad west of Lib-

erty avenue. East of Liberty avenue the old main line tracks were at a level with the industrial and other tracks, while west of Liberty avenue ramp tracks formed the connections with the other roads, which crossed under the elevated structure in Thirty-third street.

East of Liberty avenue the plans for the improvement provided for 350 ft. of steel construction and raising the main tracks on an earth fill, leaving the yard and industrial tracks at the old level, making necessary the construction of 3,400 lin. ft. of retaining walls to sustain the fill under the main tracks. It also made it necessary to relocate the main line connections to the industrial and yard tracks. The maximum raise in grade in this section approximated 17 ft. and, to secure adequate overhead clearance, the grade of the Herron avenue bridge was raised. West of Liberty avenue the plans provided for the renewal of the steel viaduct in Thirty-third street at a grade above the old, the greatest grade change being approximately 7 ft. This change necessitated the reconstruction of the ramp connection tracks before mentioned and the raising of the track on the two easterly spans of the Allegheny river bridge. The construction plan adopted was hinged on the necessity of maintaining the heavy through traffic as well as the service to the various industries, yards, and connection tracks during the progress of the work. The restricted space in Thirty-third street added to the difficulties of construction under traffic and made necessary the use of special equipment.

The Improved Line

As is shown in the map and profile of the improvement, the new and old grades diverge just west of the Pennsylvania Railroad crossing. The connection between the two was made by means of a vertical curve, 1,100 ft. long at the west end of which the new grade is 8.21 ft. above the old. The divergence of grades continues until the maximum separation of 17 ft. is made near Forfar street. Leaving Liberty avenue the grades converge gradually and join on the Allegheny river bridge. Only the two main tracks were raised to the new grades. On the north the main line connections to the industrial tracks were changed only in location, while on the south a ramp track was provided between the main and the low level yards at Liberty avenue.

To build the double-track line at the new grade it was necessary to provide a detour track and to operate a single track for a distance of 5,000 ft. during construction. Lack of space precluded the construction of two temporary tracks in Thirty-third street. Consequently the temporary track built by the American Bridge Company, contractors for the erection of the steel, from a point east of Liberty avenue to the river bridge was used for traffic purposes through this section. This track was constructed on the north side of the old tracks and of Thirty-third street, the detour being completed by building a temporary track about 600 ft. long between the American Bridge Company's high level track and the industrial tracks located on the north side of the main tracks. A ramp on a 1.5 per cent grade was provided between the high level track and the industrial tracks, and a gap was left in the north retaining wall to permit main track connections to be made with this detour track. The traffic over the single track detour was handled by an experienced telegraph operator stationed at

its easterly end who had control of train movements over the entire line. At the westerly end of the single track a switch tender and a signal operator worked under the direction of the operator at the other end.

Construction Progress

Work was begun on this project in September, 1915, and was continued without serious interruption till its completion early in 1917. As may be seen on the profile and map the change in the grade of the main track involved a maximum lift of approximately 17 ft. in the vicinity of the Herron avenue bridge. Approximately 50,000 cu. yd. of filling was placed by company forces in making this change in grade; 5,000 cu. yd. of which was secured from the excavation for the retaining walls and the remaining 45,000 cu. yd. was granulated slag and other materials secured from mills located along the lines of the system. In raising the main tracks to the new grade the traffic was diverted to the detour track and the tracks were jacked up in sections to permit the filling to be placed. No trestles were used.

In the old line, deck trusses were used to span the tracks at Herron avenue. These trusses cleared the top of the rail by only 24 ft. As the proposed raise in the tracks at the bridge was 16.8 ft., it was necessary to raise the bridge before the change in the grade of the tracks could be completed. In making the changes the clearance at the bridge was reduced to 21 ft., leaving a net raise of 13.8 ft. to be made. To avoid a corresponding raise in the roadway, through trusses were substituted in the span over the tracks.

Special Rigs Required for Driving Piles

In preparing the foundations for the retaining walls, bridge abutments and the pedestals supporting the steel via-

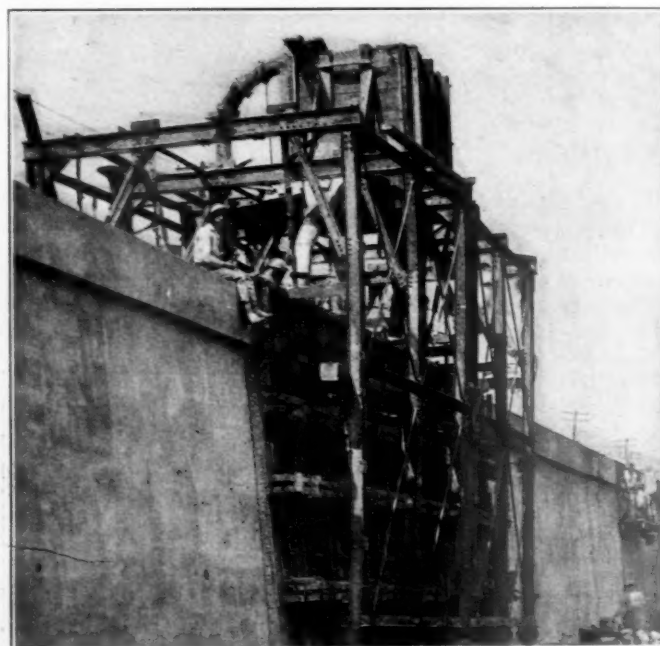


The Special Pile Driving Rig Used in Thirty-third Street

ducts, 50,000 lin. ft. of concrete piling was driven. The piles for the retaining walls and pedestals were cast-in-place and pre-cast piles were used in the piers and east abutment. The piles were driven for a 30-ton loading. The steel shells were furnished and driven by the Cranford Construction Company, Cincinnati, Ohio. The shells were withdrawn by means of six-way blocks.

The locating of the pedestals and the driving of the foun-

dation piling for the steel viaduct in Thirty-third street were complicated both by surface and sub-surface conditions. Beneath the surface were city water and gas mains and an 8-ft. circular brick sewer, while in the street were located the tracks leading to the Carnegie Upper Union mills and the substructure for the old steel viaduct which occupied nearly the entire width of the street. The surface conditions were further complicated by the necessity of maintaining the high level detour track trestle on the north side of the viaduct. The trestle consisted of single timber frame bents and I-beam stringers ranging from 20 to 30 in. in



Arrangement of the Receiving Hopper and Delivery Pipes in Building the Concrete Wall

depth according to the length of the span except at Liberty avenue where double bents were erected to carry the temporary girders used in closing the opening over the street, and at the crossing of the Carnegie tracks. At the last point it was necessary to relocate the tracks to clear the falsework and to erect specially designed bents. The special construction is shown in one of the photographs.

Before locating the pedestals for the new viaduct a complete survey and a map of sub-surface conditions were made. Once the pedestals were located their construction was hampered by the surface conditions. Because of the limited headroom available it was necessary to employ a special rig in driving the foundation piles. This rig, which is shown in a photograph, was provided with 12-ft. leads and handled the steel shells in 8 ft. sections, leaving only 4 ft. available for the hammer. The shells were driven to depths as great as 56 ft. and the rig was equipped with a 6,000-lb. hammer to increase the efficiency of the driving. Frequently the headroom was so restricted that it became necessary to dig pits for the rig to secure ample clearance for its operation.

Concrete for Retaining Wall Distributed by Air

The change in the grade of the tracks east of Liberty avenue made necessary the construction of 3,450 lin. ft. of retaining walls of the gravity type. In considering means of placing the concrete the length of the wall influenced the decision to adopt the plan of utilizing compressed air.

This plan was followed out with complete success. By referring to the map it will be seen that the north wall extends 2,800 ft. east from the east abutment of the viaduct, while the south wall is about 600 ft. in length. Including

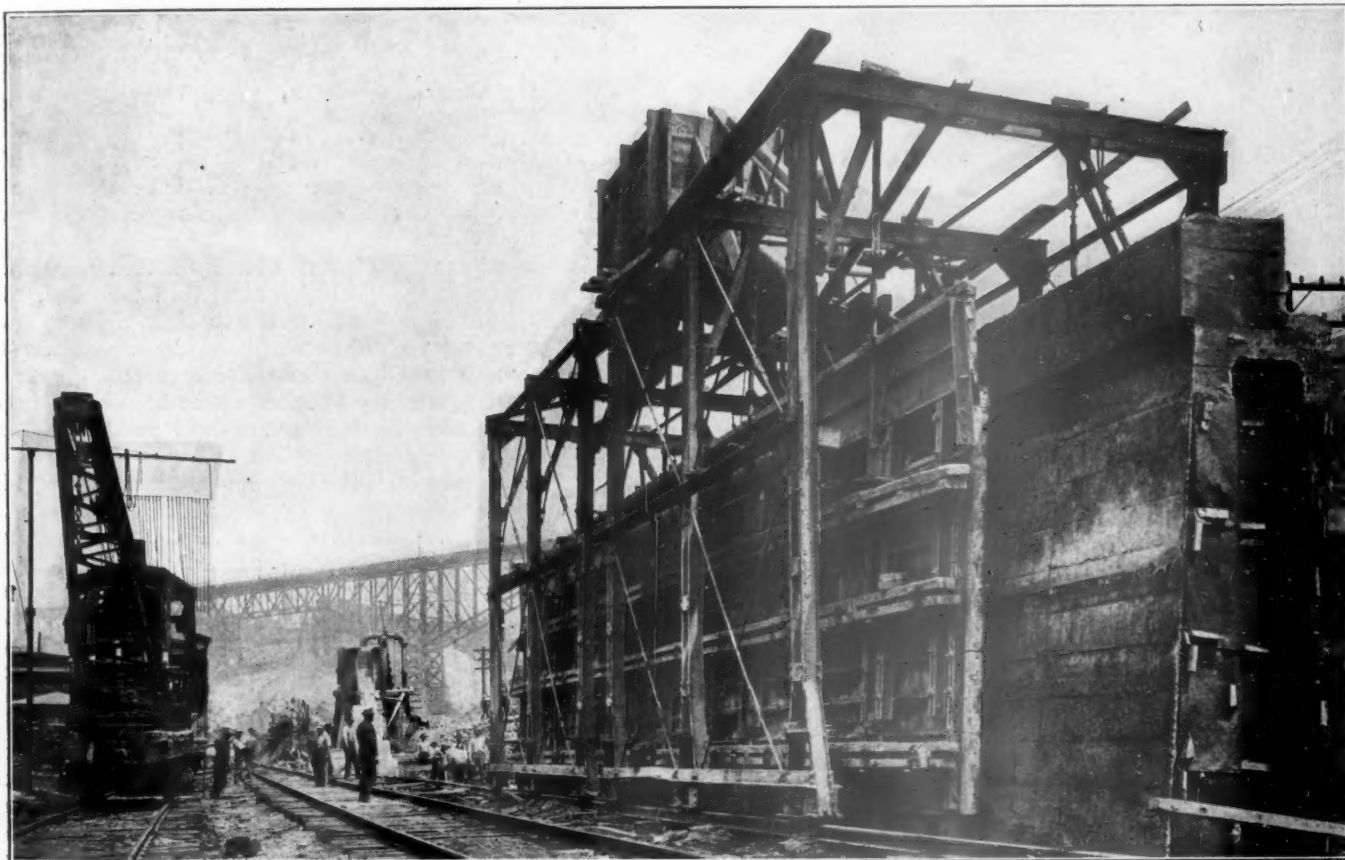
the length of the abutment the distance from end to end of walls measured along the wall is approximately 3,450 ft. To distribute the concrete through this distance by air pressure from a single central plant involved a maximum forcing distance of more than 1,500 ft.

The plant, which consisted of the mixers, boilers and the air compressor, was located on the north side of the main tracks near the center of the north wall. An 8-in. pipe was utilized to deliver the concrete from the plant to the forms. Blaw steel forms in 55-ft. sections were used throughout the work. These were mounted on wheels and were rolled forward by locomotive cranes as soon as a section of wall was sufficiently set to support the filling material.

The concrete was delivered to the forms under a pressure varying from 80 to 100 lb. At the start of the work the concrete was discharged directly into the forms, but the force of delivery was found to be too great for this practice and timber receiving hoppers were provided. These hoppers

The work was inaugurated under the general direction of F. L. Stuart, former chief engineer of the Baltimore and Ohio, and completed by R. N. Begien, his successor in office; W. S. Bouton, engineer of bridges, and Paul Didier, principal assistant engineer, were in direct charge of the work. The American Bridge Company was the contractor for the delivery and erection of the superstructure, the Cranford Construction Company, of Cincinnati, O., for the pile driving, and P. J. Joyce & Co., of New York, for the masonry.

ENGLISH "DOUBLE-HOME RAILWAYMEN."—A deputation of railwaymen was recently introduced to Lord Rhondda, the British Food Controller, by G. H. Thomas, general secretary of the National Union of Railwaymen, to point out the difficulties of about 43,000 trainmen, known as "double-home men," who had to sleep away from home probably every other night. In some few of these cases the

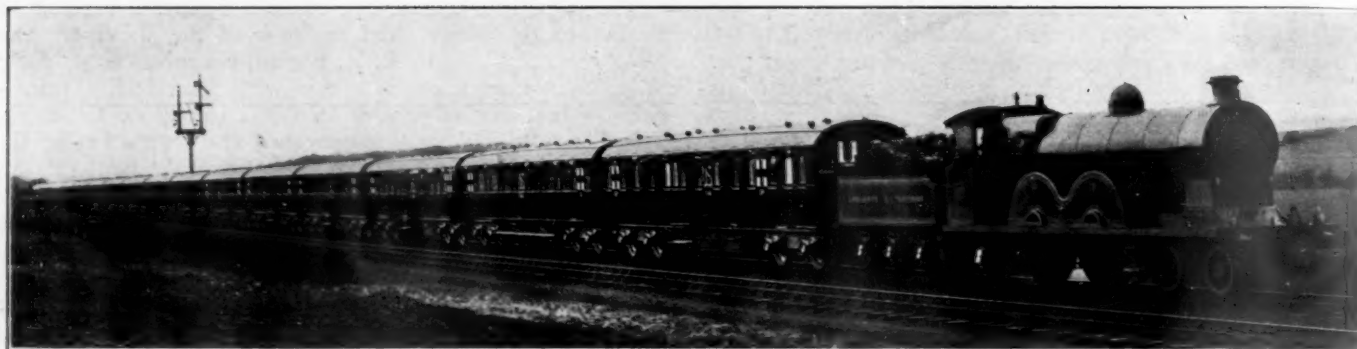


The Steel Forms Were Mounted on Wheels and Rolled to Place by a Locomotive Crane

were placed on the top of the forms and were fitted with flexible gravity discharge pipes by means of which the delivery of the concrete to the forms was controlled. The arrangement of the hoppers, and delivery and discharge pipes in reference to the forms is shown in one of the photographs.

The structural steel for the viaduct was delivered and stored in a storage yard just south of the west end of the viaduct, and, with traffic diverted over the detour trestle, the steel work between the east end of the river spans and the clearance line of the temporary structure was erected under traffic; that is, the old steel was removed and the new steel placed between trains. From this point to the east end of the improvement, the old structure was removed and the new structure placed without direct interference from traffic, by means of derrick cars and locomotive cranes, operating on the new structure, and removing the old steel and placing the new as they advanced.

men stayed in barracks or hostels provided by the railway companies, but the majority of the men stayed in lodgings. Ordinarily they took their food with them and had it cooked at the other end, but now there was a difficulty in their obtaining the food at home, and the landladies could not buy it for them, as they had not enough for themselves. Mr. Thomas suggested that the railway companies themselves might supply the men with food from their refreshment rooms, or from specially accumulated stocks. He also urged that, as a railwayman was frequently called upon to do nine or ten shifts a week, no system of rationing would be fair which did not take into account the necessary dividing up of his week into practically nine or ten days. Lord Rhondda, in reply, said that he fully realized the very exceptional circumstances and he hoped it would be possible to make arrangements to meet the difficulties of railwaymen who had to sleep from home.



General View of Ambulance Train No. 59 for the United States Army

An Ambulance Train for the United States Army

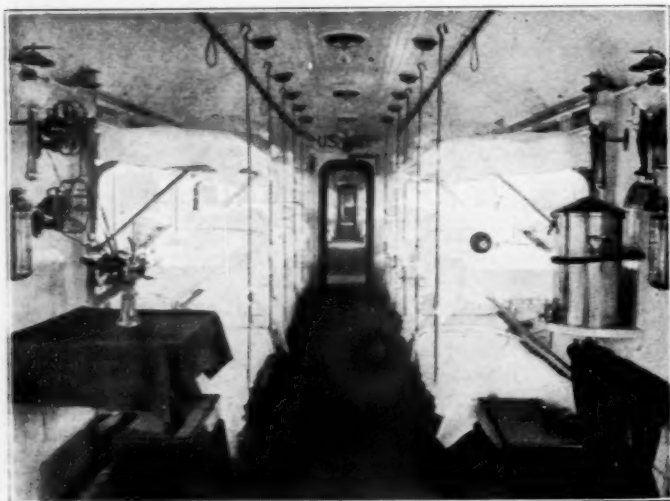
**Runs Between the Front and Base Hospitals in France;
Built by Lancashire & Yorkshire Railway**

THE LANCASHIRE & YORKSHIRE RAILWAY has just completed an ambulance train for the United States army, which is the sixth ambulance train constructed by this company since the war began. Two of these have been in constant use in Great Britain and four have been built for use on the continent. The company also has in progress two further trains for the United States army which will shortly be completed.

The latest train, which is intended for the conveyance of

The description of the train and the photographs which are here reproduced have been made available through the courtesy of Sir John Aspinall, general manager of the Lancashire & Yorkshire.

The train consists of 16 cars and has a total length of 948 ft. and weighs 442 (British) tons when unloaded. It is vestibuled throughout and fitted with electric lights and fans, and there is a total water supply on the train of 3,100 gallons. The exterior of the train is painted khaki, with a Red Cross and the letters "U. S." on both sides of each vehicle, together with the car and medical numbers. The train is heated throughout by steam and each car is fitted with a hand brake and the Westinghouse automatic air brake. There are altogether 418 cots and berths in the train for patients and personnel, and when the bottom cots are used for sitting-up cases accommodation is provided for a total of 650 persons. Emergency salvage tools such as saws, axes, hammers and crowbars, are carried on the train, and extincteurs in all ward cars, kitchens, and the pharmacy. A set of workmen's tools is also provided in the stores van.



Ward Car, with Cots Arranged for Lying-down Cases

wounded United States soldiers from the front to the base hospitals on the Continent is similar in general design to the ambulance trains previously built for the British War Office, but as the result of experience gained in the construction of these trains improvements have been made with a view to adding to the comfort and alleviating the sufferings of the sick and wounded soldiers. Everything possible has been arranged for ease in the transport of the wounded men, and for their welfare and treatment while on the journey to the base hospital, the equipment of the train being of the most complete description, and the workmanship and finish of the cars of the highest quality. At the same time every attention has been paid to providing the best arrangements for the accommodation and convenience of the medical officers, nurses, non-commissioned officers, and orderlies who travel with the train to look after the patients.

Ward Cars

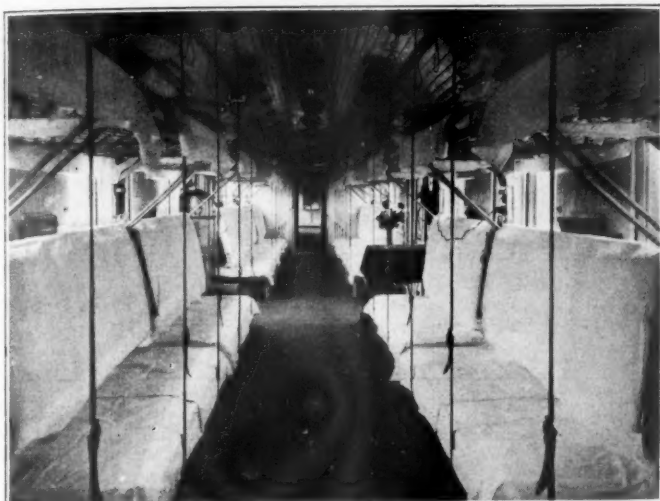
There are ten ward cars on the train, nine of which are fitted with 36 cots each for lying-down cases, or a total of 324 beds, and the other being divided into four sections with a total of 24 cots for infectious cases.

The cars are each 56 ft. long and 9 ft. wide, a pair of double doors being arranged on either side near the center of the car with ample space for the easy manipulation of stretchers. Each car has its interior finished throughout in white enamel which tends to give the wards a bright and cheerful appearance. A supply of water is carried on each car in tanks with a capacity of 150 gal. each, which are built in the roof of the vehicle, and a six-gallon tank for drinking water is fixed near the center of each ward.

For ventilation purposes both fixed and portable electric fans are provided; a small bracket and electric plug are arranged opposite each cot for the portable fans to be used for gas cases. Further ventilation of the car is secured by means of side drop windows and a large number of air extractors placed in the roof.

The cots in all the ward cars are arranged in three tiers, and owing to the variation in the cases received for transfer to the hospital bases, the cots have been designed so that the center tier may be hinged down to form a back to allow of the bottom cots being used as seats, thus doubling the accommodation; at the same time the top tier of beds may be

used for lying-down patients. All the mattresses are filled with wood fiber, and one flock and one feather pillow is supplied for each cot. In order to safeguard the transit of patients, two straps are fixed on the outside of each bed. The cots are numbered the same as in ordinary hospitals, and each ward is supplied with camp stools for the use of the nurses and portable stools for use when lifting patients



Ward Car, with Bottom Cots Arranged for Sitting-up Cases

into the top berths. A small drop table is fitted to the side of the car.

At the corners of the floor the linoleum is well rounded; this method is adopted throughout the train for hygienic purposes. Lavatory and cupboard accommodation are provided at the end of each of the ward cars. Ample provision has been made in the brake van and stores car for the conveyance of food, a desk also being fitted for the use of the storekeeper. Other little details have also been considered for the convenience of the patients, such as the provision of



Interior of the Pharmacy Car

paper racks, portable electric lamps, cuspidors and ash trays.

Pharmacy Car

This car is divided into five compartments consisting of a ward fitted with twelve cots, pharmacy, office, emergency room and stores. The car is placed in the center of the train with ward cars on either side. It has ample space for patients waiting to be dressed, and is fitted with cupboards, a folding table, hot water heater, sterilizer and sink.

One of the special features of the train is that patients can be carried on a stretcher from any of the nine ward cars into the pharmacy, the minimum gangway being 2 ft. 6 in. wide. The pharmacy car has water tanks of 300 gal. capacity, and two drinking water tanks each of six gallons capacity. The office is provided with a table, chair, cupboards, safe, and other necessary fittings. A soiled linen cupboard is fitted at the end of the car opposite the stores. The center electric light in the pharmacy portion of this car consists of a cluster of five lamps, all of which can be brought into use at once to give a greater amount of light when required for operations.

Kitchen Cars

There are two well appointed kitchen cars on the train, each 56 ft. long by 9 ft. wide, containing kitchens, 20 ft. long by 8 ft. 3 in. wide inside. One car has a linen store,



Nurses' Dining Room in the Staff Car

officers' pantry, cooks' room, sitting room for sick officers and bath room, and the other has, in addition to the kitchen, a personnel mess room, stores for officers' kits, and a mess room and lavatory for non-commissioned officers.

The kitchens are fitted with the French standard army range to burn coal, coke, or anthracite. This range has a copper boiler and hot water installation to keep a constant supply of 50 gal. of hot water. On the range are boiling pans recessed into the top plate and at the back over these pans is a water tap for filling purposes. A dresser, washing-up sink, hot and cold water supplies, and refrigerator are also fitted. A Soyer's stove is provided for use in case of emergency. The water tanks arranged in the roof have a capacity in each of these cars of 400 and 350 gal. respectively, and are fitted with gages, this feature applying to all water tanks throughout the train.

Electric fans are fitted in the kitchens, sitting room for

sick officers, cooks', personnel, and non-commissioned officers' mess rooms, the latter being provided with a seat which can be arranged to form two sleeping berths. The bath room has a white enamelled bath with hot and cold water supply, a folding wash basin, chair, sponge racks and other fittings. In addition, water may be heated by means of a steam jet from the engine.

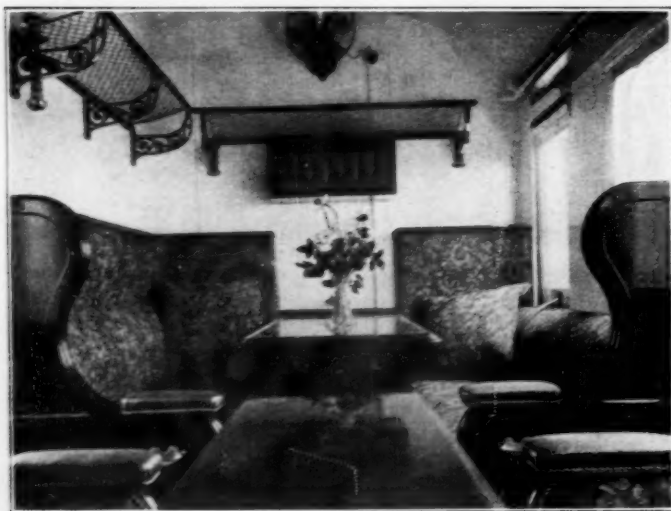
Staff Car

This car gives accommodation for four medical officers and four nurses, and is provided with day and sleeping



Kitchen Car—Looking Towards the Range and Soyer's Stove

compartments. The medical officers' mess room at one end of the car is fitted with a dining table and chairs, together with cupboards and shelves, and an electric fan. At one end is a lounge which can be arranged as a bed if required. There are three compartments with berths for the medical officers immediately adjacent to their mess room and entered from a side corridor. The berths are arranged on one side



Kitchen Car—Sitting and Dining Room for Sick Officers

of each compartment, and a seat portion can be drawn forward to make up a berth. On the opposite side is arranged a wardrobe, writing table, net rack, book shelves and a chair. For the use of the nurses a mess room has been provided at the other end of the car.

One of the features in this vehicle is that in addition to

the ordinary heating apparatus a self-contained stove and hot water system is provided to heat the car when standing in sidings. This has been arranged on account of the staff being regularly on the train.

The remainder of the personnel has accommodation in a separate car, and 33 cots are provided of a similar design to those in the ward cars so that the car can be used for carrying patients in emergency. The staff car is also provided with a self-contained heating apparatus.

This train, as well as the other hospital trains which have been fitted up by the Lancashire & Yorkshire, was built under the supervision of Geo. Hughes, chief mechanical engineer, at the road's carriage and wagon works at Newton Heath, Manchester. The composition of the train, which is designated as No. 59, is shown in the table:

| Number of cars | Accommodations for |
|---|---------------------------------|
| 1 Brake van with four infectious wards. | 24 Infectious lying-down cases. |
| 1 Staff car | 1 Train guard. |
| 1 Kitchen car with sitting room for sick officers | 4 Medical officers. |
| 4 Ward cars | 4 Nurses. |
| 1 Pharmacy car | 3 Cooks. |
| 5 Ward cars | 10 Officers. |
| 1 Kitchen car | 144 Lying-down cases. |
| 1 Personnel car | 12 Lying-down serious cases. |
| 1 Brake van and stores car..... | 180 Lying-down cases. |
| 16 Cars | 2 Non-commissioned officers. |
| | 33 Orderlies. |
| | 1 Train guard. |
| | 418 Persons. |

With the bottom beds in the ward cars used for sitting-up cases, the accommodation is increased to 650.

The Most Remarkable

Picture of the War

MANY STARTLING PICTURES have come to us from the war zone, but the one on the facing page, considering that it shows the activities behind the German lines as viewed by a French observer, is probably the most remarkable. The view shows a military railway destroyed by 420 mm. French shells and a new railway line which was built to replace it.

The following key is the identical information which was transferred to the French army staff. The photograph is practically the first of its kind to reach this country.

Key to Airplane Picture

1. Supply railway trains running on newly laid tracks.
2. Piles of supplies, chiefly timbers for use in building dugouts.
3. Rolls of barbed wire.
4. Piles of iron stakes for stringing barbed wire.
5. Steel roofing for dugouts.
6. Site of railroad station before it was destroyed by French artillery. Note the big shell craters (about 60 ft. across) caused by 420 mm. shells.
- 7-8-9. Remains of former railway tracks where they entered the station.
10. Broken ties of former railway tracks.
11. Other supplies piled up. Perishable goods covered with tent cloth.
12. Battery of four guns, with abris for the gunners.
13. Commander's dugout.
14. Ammunition park. Note the German soldiers standing around.
15. German soldiers standing in the road watching the French airplane.

The photograph is copyright by International Film Service.



The Destruction of a Railway Behind the German Lines as Viewed by a French Observer

Railway Personnel Under Government Control

Corporate Organizations Separated from Operating Functions; Policy of the Railroad Administration

WASHINGTON, D. C.

ONE OF THE MOST INTERESTING features of the plan of government control of the railroads is the effect that it is having and is likely to have on the personnel of the railroad organizations.

The process of railroad unification under government control has already progressed far enough to have an important effect in this respect and as the policies of the director general are being gradually developed and put into practice it is becoming apparent that some of the effects are likely to be even more far-reaching than was fully realized at the outset. While it has not yet been made entirely clear just how the policy is to be applied in specific instances, there have now been enough indications to give a fairly clear idea of what is to be expected in a general way, although there are many rumors as to still more drastic changes concerning which it is still impossible to speak with certainty.

The first effect on railroad personnel was the drawing into the government service of a considerable number of prominent railway officers as members of the organization of the Railroad Administration. Most of these appointments have been announced from time to time in the *Railway Age*, although there are several men who have been serving in the organization at Washington and elsewhere whose status has not been made permanent. In most cases the railroad officers who have been appointed to positions in the government organization have resigned all connection with their railroad companies and other corporations and in some instances the positions they formerly occupied have been filled by promotions.

Many of the other changes which are taking place or are under consideration result from the elimination of competition between railroads and their effect will be most noticeable in the traffic department. Others result from the separation of the financial and corporate organization of the companies from all connection with the operation of the properties, while still others result from the change in the relations of the roads to the government. Practically all of them are more or less influenced by the desire of the Railroad Administration to take advantage of the possibilities of unified operation to effect economies in operation, to offset in part, at least, the effect of the constantly increasing tendency toward increased expenses in nearly every direction, including the expected large increase in wages.

The fact that the government is directing the operation of the railroads has made unnecessary, from the govern-

ment's standpoint, many functions formerly carried on by the railway companies, and Director General McAdoo has made it clear that he does not intend to have the government pay for them. As the government is to pay the companies a fixed compensation for the use of their properties and is to collect the revenues and pay the expenses, it is apparent that all items of operating expense are in effect paid by the government. Mr. McAdoo's decisions on this subject, therefore, take the form of an order that the expense

concerned is no longer to be charged to operation, leaving the companies free to continue it, if they desire to do so, by charging it to the corporate accounts to be defrayed from the amounts they will receive from the government as compensation for the use of their properties.

It is assumed that the companies will consider it necessary to retain most of their general officers thus released, even though they may not be necessary to the purposes of the government. To the extent that they do retain them, the amount of their compensation from the government available for other purposes will therefore be reduced by the amount of the salaries and expenses involved that were formerly charged to operation. While the total expense of this kind would be smaller as compared with the total compensation it would be proportionately four times as large in comparison with a corporate income of \$950,000,000 as in comparison with total operating revenues of approximately \$4,000,000,000.

General Order No. 6

The first announcement of the policy of reduction of operating expenses by curtailing payments of salaries and expenses of officers and organizations came in General Order No. 6, issued in January, which provided that operating revenues should not be expended for the employment of attorneys not actually engaged in necessary legal work, legislative agents, or associations or organizations of carriers except as approved by the director general.

Because this order was not entirely specific and because of the difficulty of deciding what organizations were to be considered necessary most of them were authorized to continue until April 30, pending an investigation, which is still in progress, as to whether they are necessary to the operation of the roads under the circumstances.

The next manifestation of the same tendency was the issuance of a circular calling for information regarding the expenses of financial and corporate offices in New York and

A Liberty Loan Message

To Officers and Employees of Railroads
Southern Territory

By C. H. Markham

Regional Director, United States Railroad Administration,
Southern Territory

The honor and the resources of the richest government on earth are security for the Liberty Bonds and both are unimpeachable. Not only should we regard it as our patriotic duty to subscribe but we should consider it a great privilege to be able to contribute substantially toward sustaining our brave soldiers and sailors who are fighting for our safety and our honor.

We also owe it to our gallant Allies, who for four years have shed their blood and severely taxed their resources in defense of the liberties of the world, that they should be supported to the limit of our resources, not only in men but in money.

The obligation rests upon each and all of us to do and to contribute without stint. Do not stop with what you can readily spare. Only by united and constant sacrifice can we hope or shall we deserve to win.

There is no more important government service than rail transportation, and while you are faithful and efficient in this, the occasion demands more than mere performance of duty; it demands a sacrifice. I confidently appeal to you to subscribe to the fullest extent of your ability.

elsewhere. This was followed by an order on March 18 that the expenses of railroad offices, including salaries of officers devoted to financial and corporate affairs as distinguished from operation, should not be charged to operating expenses after April 1, except as expressly authorized by the Railroad Administration. The circular stated that carriers claiming that a part of such expense should be chargeable to government operation might file a statement of such claim for consideration.

It is understood that for a time the Railroad Administration contemplated a plan by which a part of certain office expenses or salaries might be charged to operation and a part to the corporate accounts, but that later this plan was deemed impracticable.

The policy as to the separation of the financial and corporate organization from the operating organization of the companies was further outlined in a general order that chairmen of boards of directors or of committees thereof shall not exercise functions connected with the operation of the railroads under federal control and in the circular stating that the director general is of opinion that the government ought not to pay the salaries and office and traveling expenses of officers whose services are not reasonably required for the operation of the railroads.

Corporations Separated from Properties

This makes it perfectly clear that the corporations are definitely separated from all control over their properties for the period of government control. Their situation has been illustrated by the analogy of a landlord who has leased his property to a tenant and who naturally expects to pay his own office and other operating expenses from his income from the rental. His contract or lease may provide for his making additions and improvements to the property from time to time and also that the tenant shall maintain the property in good repair or pay for any failure to do so. In the case of the railroads the situation is somewhat complicated by the fact that the roads were taken over under the supreme war powers of the President, without any contract or conditions, and that the contracts are being negotiated after the property has been in the control of the government for over three months.

In some of the preliminary discussions of the subject, such as those which took place during the hearings before the congressional committees before the enactment of the railroad control law, some of the statements made to describe the situation were somewhat hazy. At one time Mr. McAdoo referred to his administration as having been superimposed upon that of the railroads and of the corporations as the agencies of the government to carry on the operation of the roads. He and other representatives of the administration consistently referred to the new regime as "government control" of railroad operation, rather than as government opera-

tion. Whether or not the term "control" was regarded as preferable to "operation" during the period when transportation was in a state of semi-paralysis caused by the unprecedented weather of January, it is now evident that the government is actually operating the properties. It is enforcing its own policies, it has formed its own organization, and instead of treating the corporations as its agencies it is treating them as landlords with which it has no relation except the obligation to pay the guaranteed compensation, (the amount of which is still to a considerable extent within its control, subject to the right of court review) and to adequately maintain the properties or pay for any failure to do so. In General Order No. 17 provision was made for keeping two sets of books for each company, one set to be known as federal books and to contain the operating accounts, and one set for the corporate accounts.

While the exact interpretation to be placed on the various orders that corporate expenses are not to be charged to operation has not been made clear, the administration has served notice that any expense which it considers to have been improperly charged may be charged back against the corporation after April 1. This indicates that it expects the companies, with their own knowledge of the facts in each case, to make the decision for themselves as to which officers and offices were reasonably necessary to operation, while reserving to itself the power of ultimate determination after consideration of the circumstances.

At any rate it would appear certain that the government does not expect to pay the expenses of such offices as stock transfer and bond registering offices or any of the expenses incident to the payment of dividends and interest, which in the case of an operating company were naturally included in operating expenses. It is also clear that the salaries of

chairmen of boards and of executive committees, and of the boards of directors themselves, are to be charged to the corporate accounts. In the case of roads that have financial vice-presidents it would naturally be assumed that they would also remain with the corporation and the same would be true of counsel with offices in New York whose principal functions were to advise the directors. There are numerous instances, however, where counsel located in New York in the case of eastern roads, were actually in charge of the legal work of the company pertaining to operation and where the general counsel or legal vice-president, although located at the headquarters of the road, devoted his attention mainly to corporate affairs and perhaps received a larger salary by reason of that fact than he otherwise would have been paid.

It is understood that many of these instances in the "twilight zone," as it were, have been decided by the companies themselves, with or without the advice of officers of the Railroad Administration, and that others are being con-

"While My Brother Suffered for Me, I, Too, Made Sacrifices"

By Wm. J. Harahan

President, Seaboard Air Line

The part the one and a half million railway employes with a daily wage of \$4,000,000 should play in the present crisis is to match with service and money the sacrifices of those from our ranks who with their bodies and brains shall free us from threatened autocracy and deliver us a guaranty of safety as a free people. The blow that is necessary to accomplish this end must be backed by the concentrated power of one hundred million people. The Third Liberty Loan is an arch stone upon which all else depends. Food, ships, clothing, ammunition, guns, aeroplanes and all those things of which our men must have a never-ending supply cannot materialize without money.

The third issue is for more than one-half the coined and paper money of the United States. The railroad employes must therefore give freely of their money and of their credit.

The offer made by the railroads of this country by direction of the Director General to purchase for employes bonds to be repaid in monthly payments from future wages should meet with such joyous and liberal response that each may say, "While my brother suffered for me, I, too, made sacrifices."

sidered by the administration. For example, word has occasionally been brought to Washington by railroad officers that this or that officer will probably remain with the corporation while certain others will remain with the operating organization; and Mr. McAdoo's circular has made it plain that he expects the counsel who are now representing the companies in the negotiations with the law department of the administration, regarding the form of contract covering the compensation, to be charged to the corporate accounts.

Executive Officers

As to the executive officers the question is raised as to what will be done in the cases where there is no chairman of the board or of the executive committee other than the president. Herewith is a list of 50 leading railroad companies with the names of the chairmen or presidents or both. Under Mr. McAdoo's order the chairmen are definitely separated from the operating organizations. Apparently it

| Company | Chairman | President |
|-------------------------------------|--|--|
| Atchison, Topeka & Santa Fe..... | E. P. Ripley. | J. R. Kenly. |
| Atlantic Coast Line..... | Henry Walters | D. Willard. |
| Baltimore & Ohio..... | J. H. Hustis (Temp. Receiver). | W. A. Winburn. |
| Central of Georgia..... | C. H. Markham. | G. W. Stevens. |
| Chesapeake & Ohio..... | F. Trumbull | W. G. Bierd. |
| Chicago & Alton..... | W. J. Jackson (Receiver). | R. H. Aishton. |
| Chicago & Eastern Illinois..... | W. J. Jackson (Receiver). | Hale Holden. |
| Chicago & North Western..... | Geo. B. Harris. | S. M. Felton. |
| Chicago, Burlington & Quincy..... | Geo. B. Harris. | H. E. Byram. |
| Chicago Great Western..... | A. J. Earling. | J. E. Gorman. |
| Chicago, Milwaukee & St. Paul..... | A. J. Earling. | A. H. Smith. |
| Chicago, Rock Island & Pacific..... | John G. Shedd. | W. H. Truesdale. |
| Cleveland, Cin., Chic. & St. L..... | A. H. Smith. | L. F. Loree. |
| Delaware, Lackawanna & West'n..... | W. H. Truesdale. | T. M. Schumacher. |
| Delaware & Hudson..... | R. M. Olyphant. | F. D. Underwood. |
| El Paso & Southwestern..... | James Douglas. | W. H. Beardsley. |
| Erie..... | F. D. Underwood. | W. P. Kenney. |
| Florida East Coast..... | L. W. Hill. | C. H. Markham. |
| Great Northern..... | L. W. Hill. | James A. Baker (Receiver). |
| Illinois Central..... | C. H. Markham. | J. A. Edson. |
| International & Great Northern..... | James A. Baker (Receiver). | E. B. Thomas. |
| Kansas City Southern..... | L. F. Loree. | W. A. Clark. |
| Lehigh Valley..... | E. B. Thomas. | M. H. Smith. |
| Los Angeles & Salt Lake..... | W. A. Clark. | H. B. Ledyard. |
| Louisville & Nashville..... | Henry Walters. | W. H. Brennan. |
| Michigan Central..... | H. B. Ledyard. | C. E. Schaff (Receiver). |
| Minneapolis & St. Louis..... | Chas. Hayden. | B. F. Bush. |
| Missouri, Kansas & Texas..... | C. E. Schaff (Receiver). | J. H. Peyton. |
| Missouri Pacific..... | B. F. Bush. | A. H. Smith. |
| Nashville, Chattanooga & St. L..... | W. R. Cole. | Howard Elliott (Com. on Intercompany Relations). |
| New York Central..... | C. M. Depew. | E. J. Pearson. |
| New York, New Haven & Hartford..... | Howard Elliott (Com. on Intercompany Relations). | N. D. Maher. |
| Norfolk & Western..... | L. E. Johnson. | Jos. H. Young. |
| Norfolk Southern..... | M. J. Perry. | J. M. Hannaford. |
| Northern Pacific..... | Howard Elliott. | Samuel Rea. |
| Pennsylvania..... | Samuel Rea. | Frank H. Alfred. |
| Pere Marquette..... | E. N. Brown. | A. T. Dice. |
| Philadelphia & Reading..... | E. T. Stotesbury. | W. B. Biddle. |
| St. Louis-San Francisco..... | E. T. Stotesbury. | J. M. Herbert. |
| St. Louis Southwestern..... | E. Gould. | S. D. Warfield. |
| Seaboard Air Line..... | S. D. Warfield. | W. J. Harahan. |
| Southern..... | (Chmn. of Brd. and Ex. Com.) | Fairfax Harrison. |
| Southern Pacific System..... | J. Kruttschnitt. | Wm. Sproule. |
| Pacific System..... | J. Kruttschnitt. | W. B. Scott. |
| Texas & Louisiana Lines..... | W. B. Scott. | E. Randolph. |
| Southern Pacific of Mexico..... | E. Randolph. | J. L. Lancaster (Receiver). |
| Texas & Pacific..... | J. L. Lancaster (Receiver). | C. B. Seger. |
| Union Pacific System..... | C. B. Seger. | E. E. Calvin. |
| Union Pacific R. R..... | E. E. Calvin. | E. Calvin. |
| Oregon Short Line R. R..... | E. Calvin. | J. D. Farrell. |
| Oregon-Wash. R. R. & N. Co..... | J. D. Farrell. | E. F. Kearney. |
| Wabash..... | W. H. Williams. | L. Greer. |
| Western Maryland..... | L. Greer. | C. M. Levey. |
| Western Pacific..... | C. M. Levey. | W. M. Duncan. |
| Wheeling & Lake Erie..... | W. M. Duncan. | |

will be necessary for each company which has a president as its chief executive officer to decide whether it wishes to retain him as the head of the corporation or whether to allow him to remain as the operating head under Mr. McAdoo's control. At present such men are in what may sometimes be an embarrassing position of divided allegiance, to the company that engaged their services and to the government that is now operating the property and paying the salaries. Even before the director general issued any order

on the subject the opinion was expressed by some railroad officers that men working either in Mr. McAdoo's own organization or under his control in charge of a railroad would eventually find it necessary to separate themselves from their corporations. There have been some rumors, as yet without confirmation, that Mr. McAdoo would decide eventually to dispense with the services of the presidents altogether on the theory that he and his staff are assuming the executive responsibility and functions which formerly rested with the head of each company.

In some cases the boards of directors have elected chairmen to succeed men who have resigned to become connected with the Railroad Administration. The Union Pacific elected C. B. Seger, chairman of the executive committee in place of Judge Lovett, and the Western Maryland elected L. Greer both chairman and president succeeding Carl R. Gray. The Atchison did not elect a successor to Walker D. Hines. Marvin Hughitt has resigned as chairman of the Chicago & North Western and no successor was elected.

Many chairmen, such as George B. Harris of the Burlington, are men advanced in years who have served as presidents and have practically retired from active affairs. Others, such as Frank Trumbull of the Chesapeake & Ohio, are active but devote their attention primarily to the larger questions of finance and policy. Others, such as John G. Shedd of the Rock Island, are not practical railroad men but represent financial interests in the road. Julius Kruttschnitt is the active operating executive of the Southern Pacific with three presidents under him.

If the presidents should be displaced undoubtedly some of the inactive chairmen might retire and the presidents could be elected chairmen, but this would remove from the field of railroad operations some of the ablest railroad officers and would be a distinct loss to the service.

An article outlining the policy already indicated or expected to be followed as to the reorganization of the traffic department was published in the *Railway Age* of April 5. This policy has since been confirmed by the issuance of definite orders by the regional directors, ordering the discontinuance of all off-line traffic offices and the discontinuance or consolidation of city freight and ticket offices. A previous order had discontinued most of the advertising and publicity work. Orders were issued by Mr. McAdoo, that the employees released by these orders were to be assigned to other duties to the extent possible, but to what extent he expects to be able to continue the services of traffic officers has not yet been announced.

FRENCH RAILWAYS AID DEFENSE OF AMIENS.—The disappointment of Germany at the check to the offensive which was to end the war is considerable, says a correspondent of the *New York Globe* in a cable from Paris dated April 9. He says that the skill and rapidity with which the French troops were transported during those critical days is deserving of the highest praise. The camion service plied on all the roads day and night without a single hitch. The routing had to be done long before to meet every possible contingency. The chauffeurs drove night and day until they dropped from the seats. Even more important was the work of the railways, which were ready in advance for every emergency. The lines used by the Germans descend fanlike from Belgium into France, giving a considerable advantage over the French, whose roads parallel the front, and require transport for greater distances. The French roads were used to their absolute maximum, the equipment being supplemented by material borrowed from lines not immediately concerned. The railway men all worked at the greatest good humor for several days without sleep, carrying men, horses, guns, wagons, munitions, and supplies of every kind to the front and bringing back the wounded and the fleeing civil population.

Tentative Specifications for Standard Locomotives

General Dimensions of the Proposed Standards Have Been
Issued with Request for Number Desired

WHILE THE DETAILS of the designs of the standard locomotives for the United States government have not been completed, a tentative specification has been drawn up giving the general dimensions of the 12 locomotives proposed. These have been sent to the railway companies with a request for the number of each design the road will need to meet its requirements for new locomotives this

coal capacity of 16 tons. Unless some good and sufficient reason is given with the order for the different locomotives, the tenders shown with the specifications of the locomotives will be provided. The circular accompanying the specifications included a statement to the effect that special designs for extreme grades or other operating features which require heavier locomotives than those included in the specifications

General Dimensions of the Mikado, Santa Fe and Mallet Standard Locomotives for the Railroad Administration

| Type | Mikado | Mikado | 2-10-2 | 2-10-2 | 2-6-6-2 | 2-8-8-2 |
|---|---------------------|---------------------|---------------------|---------------------|---------------------------|---------------------------|
| Axle load | 55,000 lb. | 60,000 lb. | 55,000 lb. | 60,000 lb. | 60,000 lb. | 60,000 lb. |
| Specification Number | 1-A | 2-A | 7 | 8 | 11 | 12 |
| Gage | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. |
| Service | Freight | Freight | Freight | Freight | Freight | Freight |
| Fuel | Bit. coal | Bit. coal | Bit. coal | Bit. coal | Bit. coal | Bit. coal |
| Tractive effort | 54,600 lb. | 60,000 lb. | 69,400 lb. | 74,000 lb. | 80,300 lb. | 106,000 lb. |
| Weight in working order | 290,000 lb. | 325,000 lb. | 360,000 lb. | 390,000 lb. | 440,000 lb. | 540,000 lb. |
| Weight on drivers | 220,000 lb. | 240,000 lb. | 275,000 lb. | 300,000 lb. | 360,000 lb. | 480,000 lb. |
| Weight on leading truck | 23,000 lb. | 27,000 lb. | 30,000 lb. | 30,000 lb. | 27,000 lb. | 30,000 lb. |
| Weight on trailing truck | 47,000 lb. | 58,000 lb. | 55,000 lb. | 60,000 lb. | 53,000 lb. | 30,000 lb. |
| Weight of engine and tender in working order | 466,000 lb. | 497,000 lb. | 532,000 lb. | 596,000 lb. | 646,000 lb. | 746,000 lb. |
| Wheel base, driving | 16 ft. 9 in. | 16 ft. 9 in. | 21 ft. | 22 ft. 4 in. | 31 ft. 2 in. | 42 ft. 1 in. |
| Wheel base, rigid | 36 ft. 1 in. | 31 ft. 1 in. | 40 ft. 4 in. | 42 ft. 2 in. | 50 ft. 2 in. | 57 ft. 4 in. |
| Wheel base, total | 71 ft. 5½ in. | 71 ft. 9½ in. | 76 ft. ½ in. | 82 ft. 10½ in. | 88 ft. 10 in. | 93 ft. 3 in. |
| Wheel base, engine and tender | | | | | | |
| Ratios | | | | | | |
| Weight on drivers ÷ tractive effort | 4.0 | 4.0 | 4.0 | 4.1 | 4.5 | 4.5 |
| Total weight ÷ tractive effort | 5.3 | 5.4 | 5.2 | 5.3 | 5.5 | 5.1 |
| Tractive effort × diam. drivers ÷ equivalent heating surface* | 730.9 | 653.2 | 629.6 | 665.9 | 623.1 | 717.6 |
| Equivalent heating surface* ÷ grate area | 70.6 | 81.7 | 82.5 | 79.4 | 96.3 | 87.5 |
| Firebox heating surface ÷ equivalent heating surface, per cent. | 6.1 | 5.5 | 5.9 | 6.1 | 5.8 | 5.1 |
| Weight on drivers ÷ equiv. heating surface* | 46.8 | 41.5 | 43.8 | 42.9 | 49.0 | 57.0 |
| Total weight ÷ equivalent heating surface* | 61.6 | 56.2 | 57.3 | 56.2 | 59.9 | 64.1 |
| Volume both cylinders | 18.4 cu. ft. | 21.2 cu. ft. | 21.2 cu. ft. | 26.4 cu. ft. | 21.9 cu. ft. | 26.9 cu. ft. |
| Equivalent heating surface* ÷ vol. cylinders | 255.3 | 272.9 | 296.3 | 265.2 | 336.1 | 312.7 |
| Grate area ÷ vol. cylinders | 3.6 | 3.3 | 3.6 | 3.3 | 3.5 | 3.6 |
| Cylinders | | | | | | |
| Kind | Simple | Simple | Simple | Simple | Compound | Compound |
| Diameter and stroke | 26 in. by 30 in. | 27 in. by 32 in. | 27 in. by 32 in. | 30 in. by 32 in. | 23 in. & 35 in. by 32 in. | 25 in. & 39 in. by 32 in. |
| Valves | | | | | | |
| Kind | Piston | Piston | Piston | Piston | Piston | Piston |
| Diameter | 14 in. | 14 in. | 14 in. | 14 in. | 14 in. | 14 in. |
| Wheels | | | | | | |
| Driving, diameter over tires | 63 in. | 63 in. | 57 in. | 63 in. | 57 in. | 57 in. |
| Boiler | | | | | | |
| Style | Con. Wag. Top | Con. Wag. Top | Con. Wag. Top | Con. Wag. Top | Straight Top | Con. Wag. Top |
| Working pressure | 200 lb. per sq. in. | 190 lb. | 200 lb. | 190 lb. | 225 lb. | 240 lb. |
| Outside diameter of first ring | 78 in. | 86 in. | 86 in. | 88 in. | 90 in. | 98 in. |
| Firebox, length and width | 114½ in. by 84½ in. | 120½ in. by 84½ in. | 114½ in. by 96½ in. | 132½ in. by 96½ in. | 114½ in. by 96½ in. | 176½ in. by 96½ in. |
| Tubes, number and outside diameter | 216—2½ in. | 247—2½ in. | 247—2½ in. | 271—2½ in. | 247—2½ in. | 274—2½ in. |
| Flues, number and outside diameter | 40—5½ in. | 45—5½ in. | 45—5½ in. | 50—5½ in. | 45—5½ in. | 53—5½ in. |
| Tubes and flues, length | 19 ft. | 19 ft. | 20 ft. 6 in. | 20 ft. 6 in. | 24 ft. | 24 ft. |
| Heating surface, tubes | 2,407 sq. ft. | 2,752 sq. ft. | 2,970 sq. ft. | 3,258 sq. ft. | 3,478 sq. ft. | 3,960 sq. ft. |
| Heating surface, flues | 1,090 sq. ft. | 1,226 sq. ft. | 1,323 sq. ft. | 1,469 sq. ft. | 1,549 sq. ft. | 1,825 sq. ft. |
| Heating surface, firebox | 286 sq. ft. | 319 sq. ft. | 373 sq. ft. | 429 sq. ft. | 429 sq. ft. | 432 sq. ft. |
| Heating surface, total | 3,783 sq. ft. | 4,297 sq. ft. | 4,666 sq. ft. | 5,156 sq. ft. | 5,456 sq. ft. | 6,217 sq. ft. |
| Superheater heating surface | 882 sq. ft. | 993 sq. ft. | 1,078 sq. ft. | 1,230 sq. ft. | 1,260 sq. ft. | 1,475 sq. ft. |
| Equivalent heating surface* | 4,706 sq. ft. | 5,787 sq. ft. | 6,283 sq. ft. | 7,001 sq. ft. | 1,346 sq. ft. | 8,420 sq. ft. |
| Grate area | 66.7 sq. ft. | 70.8 sq. ft. | 76.3 sq. ft. | 88.2 sq. ft. | 76.3 sq. ft. | 96.2 sq. ft. |
| Tender | | | | | | |
| Tank | Wat. Bot. | Wat. Bot. | Wat. Bot. | Wat. Bot. | Wat. Bot. | Wat. Bot. |
| Weight | 172,000 lb. | 172,000 lb. | 172,000 lb. | 206,000 lb. | 206,000 lb. | 206,000 lb. |
| Water capacity | 10,000 gal. | 10,000 gal. | 10,000 gal. | 12,000 lb. | 12,000 gal. | 12,000 gal. |
| Coal capacity | 16 tons | 16 tons | 16 tons | 16 tons | 16 tons | 16 tons |

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

year. No discussion of the designs was requested. The roads were cautioned to check the limiting dimensions carefully and to allow for axle loads slightly heavier than those shown, as an added precaution, for it may be possible that after the locomotives are built the axle loads will be higher than those shown in the tentative specifications.

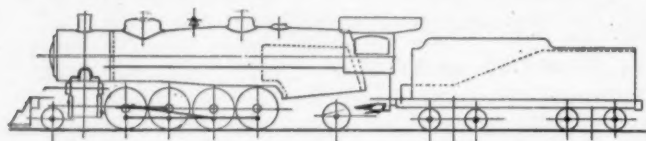
There are three designs of tenders to be used with the 12 different locomotives, one having a capacity of 8,000 gal., another 10,000 gal., and the third 12,000 gal., all having a

were too few and extreme to require standardizing. It was also stated that requirements for locomotives for roads which could not operate locomotives of the wheel loads of the standard locomotives would be filled with locomotives of lighter axle load, which would be released by the standard locomotives.

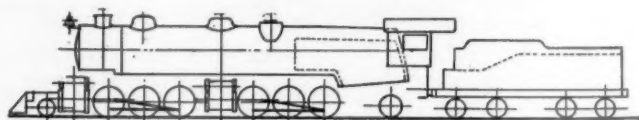
A general outline of the different types of locomotives proposed and a list of the general dimensions and data is given in the illustrations and tables. In the main it has been the

desire of the committee designing the locomotives to provide designs which will best meet average conditions. For instance, freight locomotives of the Mikado, Santa Fe and Mallet types

creasing the boiler pressure. The Pacific and Mountain type locomotives for passenger service have tractive efforts of 40,700 lb., 43,800 lb., 53,900 lb. and 58,000 lb. The six-



Outline of U. S. Standard Mikado Type Locomotive

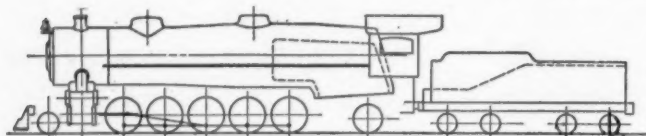


Outline of Standard 2-6-6-2 Mallet

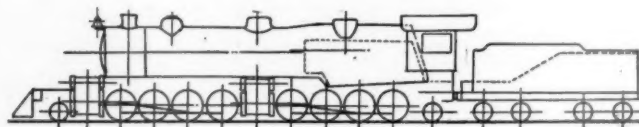
have been evolved which have the following tractive efforts: 54,600 lb., 60,000 lb., 69,400 lb., 74,000 lb., 80,300 lb. and 106,000 lb. This covers the range of tractive efforts for

wheel and eight-wheel switchers have tractive efforts of 39,100 lb. and 51,200 lb. respectively.

There are two sizes of drivers used on the freight engines:



Outline of Standard 2-10-2 Type Locomotive



Outline of Standard 2-8-8-2 Mallet

freight service fairly well. The boiler factors of the heavy Mikado and of both of the Santa Fe type locomotives are sufficiently high to permit increased tractive effort by in-

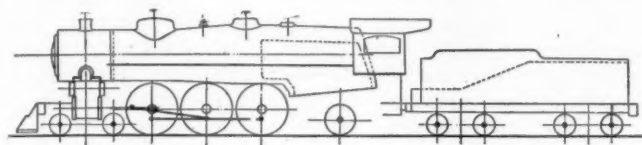
creasing the boiler pressure. The Pacific and Mountain type locomotives for passenger service have tractive efforts of 40,700 lb., 43,800 lb., 53,900 lb. and 58,000 lb. The six-

General Dimensions of the Pacific, Mountain and Switcher Standard Locomotives for the Railroad Administration

| Type | Pacific | Pacific | Mountain | Mountain | 0-6-0 | 0-8-0 |
|---|---------------------|---------------------|---------------------|---------------------|--------------------|---------------------|
| Driving axle load | 55,000 lb. | 60,000 lb. | 55,000 lb. | 60,000 lb. | 55,000 lb. | 55,000 lb. |
| Specification No. | 5-A | 6-A | 3-A | 4-A | 9 | 10 |
| Gage | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. | 4 ft. 8½ in. |
| Service | Passenger | Passenger | Passenger | Passenger | Switching | Switching |
| Fuel | Bit. Coal | Bit. Coal | Bit. Coal | Bit. Coal | Bit. Coal | Bit. Coal |
| Tractive effort | 40,700 lb. | 43,800 lb. | 53,900 lb. | 58,000 lb. | 39,100 lb. | 51,200 lb. |
| Weight in working order | 270,000 lb. | 300,000 lb. | 320,000 lb. | 350,000 lb. | 165,000 lb. | 220,000 lb. |
| Weight on drivers | 165,000 lb. | 180,000 lb. | 220,000 lb. | 240,000 lb. | 165,000 lb. | 220,000 lb. |
| Weight on leading truck | 52,000 lb. | 60,000 lb. | 50,000 lb. | 55,000 lb. | | |
| Weight on trailing truck | 53,000 lb. | 60,000 lb. | 50,000 lb. | 55,000 lb. | | |
| Weight of engine and tender in working order | 414,000 lb. | 444,000 lb. | 492,000 lb. | 522,000 lb. | 309,000 lb. | 364,000 lb. |
| Wheel base, driving | 13 ft. | 14 ft. | 18 ft. 3 in. | 18 ft. 3 in. | 11 ft. 0 in. | 15 ft. 0 in. |
| Wheel base, total | 34 ft. 9 in. | 36 ft. 2 in. | 40 ft. 0 in. | 40 ft. 0 in. | 11 ft. 0 in. | 15 ft. 0 in. |
| Wheel base, engine and tender | 68 ft. 7½ in. | 70 ft. 8½ in. | 75 ft. 8½ in. | 75 ft. 8½ in. | 48 ft. 10½ in. | 52 ft. 10½ in. |
| Ratios | | | | | | |
| Weight on drivers ÷ tractive effort | 4.1 | 4.1 | 4.1 | 4.1 | 4.2 | 4.3 |
| Total weight ÷ tractive effort | 6.6 | 6.8 | 5.9 | 6.0 | 4.2 | 4.3 |
| Tractive effort × diam. drivers ÷ equivalent heating surface* | 656.7 | 674.1 | 668.2 | 637.0 | 607.6 | 700 |
| Equivalent heating surface* ÷ grate area | 67.8 | 72.5 | 78.6 | 82.4 | 79.0 | 80.1 |
| Firebox heating surface ÷ equivalent heating surface, per cent. | 5.8 | 6.1 | 6.4 | 5.9 | 5.6 | 5.7 |
| Weight on drivers ÷ equiv. heating surface* | 36.5 | 35.1 | 39.5 | 38.2 | 63.3 | 58.9 |
| Total weight ÷ equivalent heating surface* | 59.7 | 58.5 | 57.5 | 55.7 | 63.3 | 58.9 |
| Volume both cylinders | 15.9 cu. ft. | 18.6 cu. ft. | 19.9 cu. ft. | 21.4 cu. ft. | 11.2 cu. ft. | 15.9 cu. ft. |
| Equivalent heating surface* ÷ vol. cylinders | 284.4 | 276.6 | 280.0 | 293.9 | 232.3 | 244.5 |
| Grate area ÷ vol. cylinders | 4.2 | 3.8 | 3.6 | 3.6 | 2.9 | 2.9 |
| Cylinders | | | | | | |
| Kind | Simple | Simple | Simple | Simple | Simple | Simple |
| Diameter and stroke | 25 in. by 28 in. | 27 in. by 28 in. | 27 in. by 30 in. | 28 in. by 30 in. | 21 in. by 28 in. | 25 in. by 28 in. |
| Valves | | | | | | |
| Kind | Piston | Piston | Piston | Piston | Piston | Piston |
| Diameter | 14 in. | 14 in. | 14 in. | 14 in. | 10 in. | 14 in. |
| Wheels | | | | | | |
| Driving, diameter over tires | 73 in. | 79 in. | 69 in. | 69 in. | 51 in. | 51 in. |
| Boiler | | | | | | |
| Style | Con. W. T. | Con. W. T. | Con. W. T. | Con. W. T. | Straight top | Straight top |
| Working pressure, lb. per sq. in. | 200 | 200 | 200 | 200 | 190 | 175 |
| Outside diameter of first ring | 76 in. | 78 in. | 78 in. | 86 in. | 66 in. | 80 in. |
| Firebox, length and width | 114½ in. by 84½ in. | 120½ in. by 84½ in. | 120½ in. by 84½ in. | 114½ in. by 96½ in. | 72½ in. by 66½ in. | 102½ in. by 66½ in. |
| Tubes, number and outside diameter | 188—2½ in. | 216—2½ in. | 216—2½ in. | 247—2½ in. | 158—2 in. | 230—2 in. |
| Flues, number and outside diameter | 36—5½ in. | 40—5½ in. | 40—5½ in. | 45—5½ in. | 24—5½ in. | 36—5½ in. |
| Tubes and flues, length | 19 ft. 0 in. | 19 ft. 0 in. | 20 ft. 6 in. | 20 ft. 6 in. | 15 ft. 0 in. | 15 ft. 0 in. |
| Heating surface, tubes | 2,091 sq. ft. | 2,407 sq. ft. | 2,598 sq. ft. | 2,970 sq. ft. | 1,233 sq. ft. | 1,796 sq. ft. |
| Heating surface, flues | 981 sq. ft. | 1,090 sq. ft. | 1,176 sq. ft. | 1,323 sq. ft. | 515 sq. ft. | 773 sq. ft. |
| Heating surface, firebox | 234 sq. ft. | 284 sq. ft. | 329 sq. ft. | 346 sq. ft. | 130 sq. ft. | 190 sq. ft. |
| Heating surface, arch tubes | 27 sq. ft. | 27 sq. ft. | 27 sq. ft. | 27 sq. ft. | 16 sq. ft. | 22 sq. ft. |
| Heating surface, total | 3,333 sq. ft. | 3,808 sq. ft. | 4,130 sq. ft. | 4,666 sq. ft. | 1,894 sq. ft. | 2,781 sq. ft. |
| Superheater heating surfaces | 794 sq. ft. | 882 sq. ft. | 957 sq. ft. | 1,078 sq. ft. | 475 sq. ft. | 637 sq. ft. |
| Equivalent heating surface | 4,524 sq. ft. | 5,133 sq. ft. | 5,566 sq. ft. | 6,283 sq. ft. | 2,607 sq. ft. | 3,737 sq. ft. |
| Grate area | 66.7 in. | 70.8 sq. ft. | 70.8 sq. ft. | 76.3 sq. ft. | 33 sq. ft. | 46.6 sq. ft. |
| Tender | | | | | | |
| Tank | Water Bot. | Wat. Bot. | Wat. Bot. | Wat. Bot. | Wat. Bot. | Wat. Bot. |
| Weight | 144,000 lb. | 144,000 lb. | 172,000 lb. | 172,000 lb. | 144,000 lb. | 144,000 lb. |
| Water capacity | 8,000 gal. | 8,000 gal. | 10,000 gal. | 10,000 gal. | 8,000 gal. | 8,000 gal. |
| Coal capacity | 16 tons | 16 tons | 16 tons | 16 tons | 16 tons | 16 tons |

*Equivalent heating surface = total evaporative heating surface + 1.5 times the superheating surface.

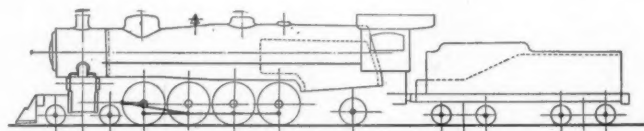
73-in. wheel, the heavy Pacific a 79-in. wheel and both the Mountain types a 69-in. wheel. The wheels of both switchers are 51 in. in diameter. Superheaters and brick arches are used on all of the locomotives, and it has been said that the Santa Fe and Mallet types will be equipped with stokers. All designs except the switchers are provided with combustion chambers. It may be said that with a possible exception



Outline of Standard Pacific Type

of the two Pacific type locomotives, the boilers are of ample capacity.

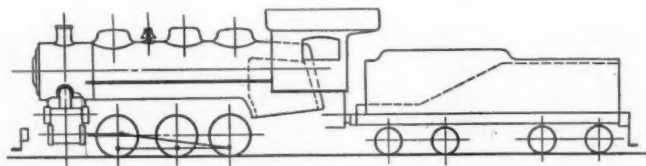
The locomotives are all designed to traverse 19 deg. curves and grades of two per cent. The clearance limitations are practically alike, the over-all height being 15 ft., with the exception of the heavy Santa Fe type and the 2-8-8-2 Mallet, which have height clearance of 15 ft. 9 in. The width over



Outline of Standard Mountain Type

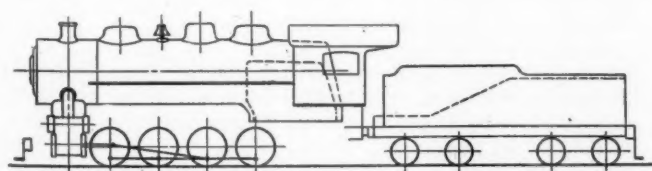
cylinders is 10 ft. 4 in. for all designs, with the exception of the heavy Santa Fe type and the large Mallet, which is 10 ft. 9 in. and the smaller Mallet, which is 10 ft. 6 in. The width over cab body and over cab eaves, including the cab handles, is the same for all designs, being 10 ft. in the first case and 10 ft. 2 in. in the second.

A casual study of these limitations indicates that there



Outline of Standard Six-Wheel Switcher

will be some difficulties, particularly around terminals, due to low bridges. The Boston & Maine has three bridges around Boston with a clearance of 14 ft. 9 in. There are the same limitations on some bridges in the vicinity of the Union Station in Cincinnati; between the Chicago Terminal and the California yards of the North Western there is a



Outline of Standard Eight-Wheel Switcher

limitation of 14 ft. 10 in. and on the C. B. & Q. between St. Louis and East St. Louis the limitations are 14 ft. 7 in. On the Michigan Central at Detroit the minimum clearance is 14 ft. 3 in. On the main line of the Chesapeake & Ohio, between Charlottesville and Clifton Forge, Va., a distance of 116 miles, the minimum clearance is 15 ft. This is in a

mountainous territory and it will be impossible to use either the heavy Santa Fe type or the 2-8-8-2 Mallet. The 2-6-6-2 Mallet will, however, come within these limitations. The Hoosic tunnel of the Boston & Maine has a height clearance of 14 ft. 8 in., which will prevent any of these standard locomotives passing through this tunnel.

It has been said that all roads requiring new locomotives are to be supplied with these standard designs and that any change that will be required to meet local conditions, such as will be necessary according to the grades of coal used, will have to be made by the railroads, as the locomotives are received from the builders.

Electric Switch Machines

With Distant Control

THE LOW-VOLTAGE SWITCH MACHINE is coming to be more extensively appreciated. The New York, New Haven & Hartford is installing these machines at about 25 switches which are approximately one mile distant from the nearest signal station, and in their use will be able to save from five to ten or more minutes' time for each of numerous heavy freight trains, every day, by doing away with the stops which hitherto have been necessary, for such trains, to allow a trainman to set switches by hand preparatory to entering side tracks. This time, say an average of 7 minutes, is the estimated loss every time that a train has to go into a passing track to make way for a faster train. The switch machines are to be placed at all of the passing-track switches between New Haven and Boston which are not already operated from towers.

This investment of the New Haven road, amounting with signal changes to perhaps \$100,000, affords an interesting illustration of careful adaptation of the best methods and facilities under rather unfavorable circumstances. The portion of the line on which these machines are to be installed is that from New Haven, Conn., to Readville, Mass., 147 miles; that portion of the main line between New York and Boston which has not been four-tracked. This section is operated by the controlled manual block system, the signal towers in most cases being in the same locations at which

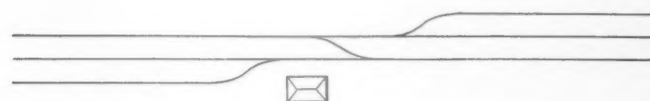


Fig. 1.—Signal Station with Two Passing Tracks.

they were placed when the system was put in operation about 25 years ago.

Nearly or quite all of the passing sidings on these divisions are so located that their outlets are at or near the block signal tower; and originally they were connected with the main track only at the outgoing end; all trains had to be backed in. (See Fig. 1.) As traffic has increased, these tracks have had to be lengthened, and facing-point switches have been added, by which to let freight trains into the sidings; and to insure safety, under the manual block operation these switches, hand-operated, have been electrically locked, the lock being controlled by the signal station in the rear.

These sidings, 20 or more in number, are now provided liberally for both eastbound and westbound trains. They are long enough to hold 100-car trains, and their locations are roughly indicated on the large drawing. (A few of the switches were already electrically operated.) With hand-thrown switches the ordinary procedure, with a train having to make way for a passenger train, is to bring it to a stop before reaching the switch and to communicate by bell code

or telephone with the signal cabin; and, having got the switch unlocked, to move the train into the siding; the trainman at the rear of the train must then set the switch straight, and advise the signalman in the cabin that the main track is clear. With the long and heavy trains now common in through freight service this, of course, is a time-consuming process at best; and if, because of difficulty in starting, or for any reason, a coupling is broken, the delay may be considerable.

The stations at which these long sidings are situated, some stations having two and others having one, are as follows, the first six being in Connecticut, the next six in Rhode Is-

A typical station, that at East Haven, six miles from New Haven, is shown in Fig. 2. The switches remotely operated are those at the extreme left (or west) end of the drawing, about 4,200 ft. from the tower. The signals for these switches, A, B and F, are also operated by low-voltage machines. The Hayes derails, C and F, are operated with the switches, and the same is true of the three pot-signals at this location. These pot-signals, for westbound movements on track 6, westbound movements on track 2 and eastbound movements on track 1, are used very infrequently.

At electric interlockings, the new switches and signals to be added will be operated at 110 volts, the same as the ma-

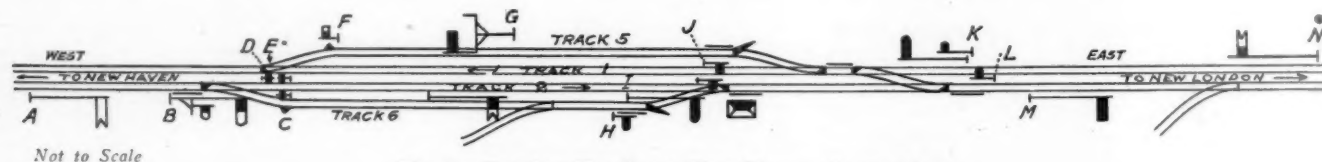


Fig. 2.—Passing Tracks at East Haven, Connecticut.

land and the other four in Massachusetts: East Haven, Madison, Clinton, Sound View, Midway, Stonington, Westerly, Bradford, Wood River Junction, Kingston, Wickford Junction, East Greenwich, East Junction, Attleboro, Mansfield and Sharon Heights. At Westerly there is an electric interlocking, but at all of the other cabins at which the long sidings are to be signaled the interlocking is mechanical.

A low-voltage switch machine has been in operation at East Greenwich for about two years, with satisfactory results. Electric power at 110 volts or higher is not conveniently available at this point and the use of a low voltage current, which can be supplied by either a primary or a storage battery, affords substantially all of the advantages of remote operation (making hand-throwing of switches unnecessary) at a reasonable cost. The only disadvantage, the slow movement of the switch, is no disadvantage at all, as the signalman has several minutes in which to make each movement.

chines and signals now in service, and power at 110 volts is available at one other place.

At all of the locations track circuits are to be installed to provide complete approach and detector locking. Whenever automatic block signals shall be introduced on this part of the road, the direct current motors, and other apparatus, can be replaced with alternating current equipment, and the arrangement of track circuits can remain practically unchanged. The switch-and-lock movements are operated at 20 volts, and they are about equally divided between the Union Switch & Signal Company's type M and the General Railway Signal Company's model 5. All of the signals are of the General Railway Signal Company's 2A type. Power for the low-voltage machines is supplied from three sets of four cells each of Exide storage battery. Facilities have been provided at division headquarters for recharging these batteries at stated intervals. It is cal-

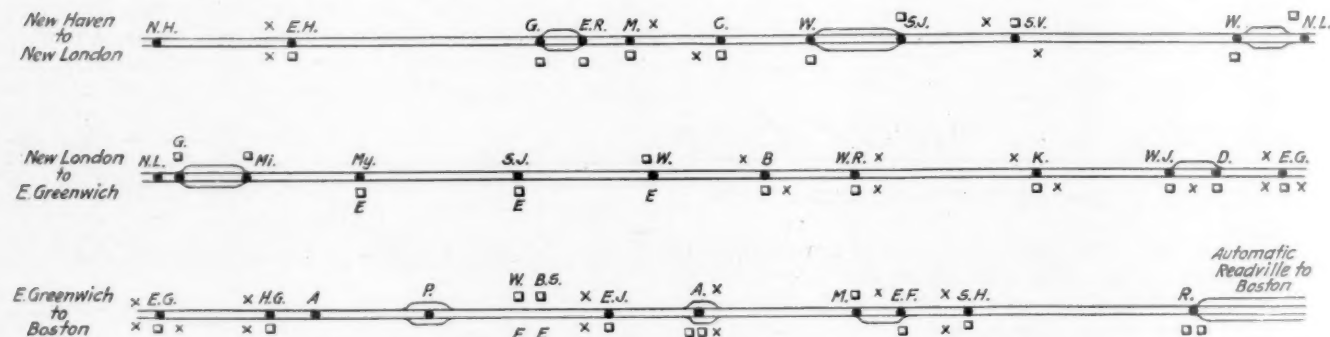


Fig. 3.—Distant Switch-Machines Between New Haven and Readville

Locations Indicated by Crosses (X).

Distances: New Haven eastward to New London, 51 miles; New London to East Greenwich, 50 miles; East Greenwich to Readville, 47 miles, and to Boston, 57 miles.

It is the favorable experience at this point which has led to the more extensive use here described. To secure the benefits of electrical operation of distant switches by any other means would be practically out of the question. To establish and maintain power plants at each station would involve prohibitive cost, while the purchase of power from local sources (where practicable) would introduce undesirable complications.

These long sidings do not comprise the whole of the facilities for running fast trains past slow trains, as there are several short sections of four-track line. The entrances to (and exits from) the sidings are in all cases through No. 20 turnouts, allowing speeds of 25 miles an hour and even faster.

culated that with the normal load—switch, switch lock, derail (pipe connected) and detector bar—a movement will be made in 35 seconds. The low-voltage machine will clear a signal in about 15 seconds.

The stations between New Haven and Boston, so far as they are of interest in connection with this article, are shown in the table, with the distances from New Haven.

The sketch of the line, shown below, is intended merely to show the relative locations of the passing tracks; and the stations are indicated by initials only. Each signal station (tower) is indicated by a small square, and the electric switch movements are indicated by small crosses. For example, at East Greenwich there are operated from the tower three low-

voltage machines; two on the west (one for eastbound trains entering the eastbound siding, one for westbound trains leaving the westbound, and one machine on the east for eastbound trains leaving). The letter *E* at a station, shown be-

| New Haven Division | | New London Division Continued | |
|---------------------------|-------|-------------------------------|-------|
| | Miles | | Miles |
| New Haven | 0 | Kingston | 90 |
| East Haven | 6 | Wickford Junction | 96 |
| Guilford | 17 | Davisville | 98 |
| East River | 19 | East Greenwich | 101 |
| Madison | 21 | Hills Grove | 106 |
| Clinton | 25 | | |
| Westbrook | 29 | Providence Division | |
| Saybrook Junction | 33 | Auburn | 108 |
| Sound View | 38 | Providence | 113 |
| Waterford | 48 | Woodlawn | 117 |
| New London Division | | Boston Switch | 118 |
| New London | 51 | East Junction | 121 |
| Groton | 52 | Attleboro | 125 |
| Midway | 55 | Mansfield | 132 |
| Mystic | 60 | East Foxboro | 134 |
| Stonington | 67 | Sharon Heights | 137 |
| Westerly | 73 | Readville | 147 |
| Bradford | 78 | Boston | 157 |
| Wood River Junction | 82 | | |

low the track line, indicates an electric interlocking, with all switches and signals worked by 110-volt motors. No sidings

Pneumatic Tampers

Break Up Frozen Coal

By H. L. Hicks

DURING THE RECENT severely cold weather there has been developed a novel and very interesting adaptation of the pneumatic tie tamper to break up frozen coal in unloading hopper bottom cars, and it is said that excellent results have been obtained at coal depots around New York, Chicago and several of the lake ports where the scheme has been introduced. At Chicago the tampers have also been applied to picking frozen ore in cars, clearing mill scale from the chutes at steel mills and breaking up frozen scale in gondola cars. At one point where the tampers were being used the experiment was tried of putting the tamper against the side of a car of unfrozen soft coal. The vibration set up caused the coal to let go and move out of the car with a rush.

For this work the tamping machines have been fitted with pointed picks in place of the usual tamping bars. The tools are of sufficiently light weight to afford convenient handling regardless of the work or its location. The two center pho-



The Tamping Points

(Top) Starting to Loosen a Car of Coal. (Bottom) Keeping the Hoppers Open

Emptying a Car of Coal

are shown in the sketch. Those sections where more than two tracks are shown on the drawing indicate short pieces of road operated as four-track from one signal station to another (or, as at Wickford Junction and Mansfield, a freight running track extending from one station to the next station).

SWEDISH FUND FOR SUPPORTING FOREIGN TRADE AFTER WAR.—The Finance Minister has made a suggestion to the Swedish Parliament that the government create a fund for the operation and guaranteeing of a company to support foreign trade after the war, and especially to arrange for the import of necessary goods. It is proposed that the company have a capital stock of \$2,680,000, and that this stock be offered to a syndicate of banks which have already expressed a wish to subscribe. The stock is to be guaranteed by deposit of government bonds.—*Commerce Reports.*

tographs show the starting and the last stage in unloading a solidly frozen car of buckwheat anthracite after the usual steam thawing had been completed. At this coal dock it was found advantageous to station one man outside the car, as shown in the photograph at the left, to break up the lumps which clogged the chute. The general opinion is that the tampers are most effective in frozen bituminous and the smaller sizes of anthracite coal.

FREIGHT CARS TAKE WOUNDED TO GERMANY.—Trains carrying wounded Germans from the battle front in France are proceeding continuously along the frontier between Germany and Holland, according to a despatch to the *Telegraaf* from Kerkrade. It has been necessary to replace hospital cars by freight cars, in which the wounded lie on straw and shavings.

Hughitt Retires as North Western Chairman

Resigns After 46 Years of Service, Including 7½ Years as
Head of Board of Directors and 23 Years as President

THE RESIGNATION OF MARVIN HUGHITT as chairman of the board of directors of the Chicago & North Western marks the close of a career of nearly half a century with that company, during more than 30 years of which he has directed its affairs. This alone is an unusual record, which is rendered more remarkable by the consistently sound and excellent management of the property during the period of his leadership. In fact, it may well be said that in guiding the development of the North Western System Mr. Hughitt has built a great living monument to his own genius,—a justifiable source of pride as he lays down the reins in favor of younger men.

While it is difficult to avoid the use of superlatives in passing judgment on his work, Mr. Hughitt has always entertained a distaste for overdrawn publicity and has preferred to discharge his duties quietly and energetically with the one end in view of serving the public and strengthening his road. He has never undertaken any project or initiated any policy for the purpose of firing popular imagination nor has he ever yielded to the pressure of the political passions or fads of the moment. He has never sought the public eye and has yet to learn the meaning of the word "expediency." The growth of the North Western System, he modestly explains, is nothing unusual, but represents a consistent adherence to a sound policy of financing and operation throughout a period of years. Neither does it represent the work of one man but rather the joint efforts of an aggregation of loyal and conscientious officers and employees. There is no doubt that the excellent esprit de corps of both the officers and the men in the ranks explains, in considerable measure, the high standing of the road today, but there is no discounting the quality of the leadership which encouraged that spirit of co-operation and unfailing fidelity to duty. Mr. Hughitt's personality is a strong one, and he has projected his ideals and his policies into the work of his subordinates.

A keen thinker, endowed with the power of clear analysis, he has never vacillated after working out the problems presented to him, but relying on his decisions once they were made, he has acted accordingly. While he has valued the opinions of his business associates and assistants he has never hesitated to stand alone if his judgment demanded such a course. He has carried on all his business dealings on the highest plane of honor. A prominent Chicago business man who has known him since the 70's, declares that

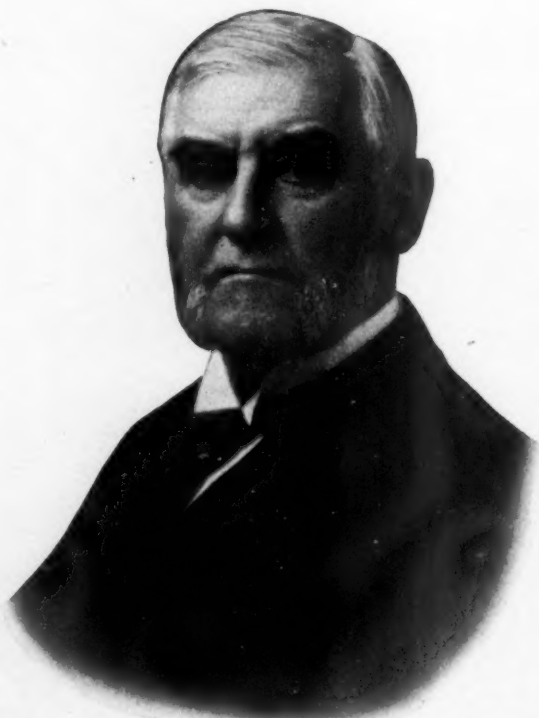
Mr. Hughitt's unfailing adherence to his word won the respect of all with whom he came in contact. While positive in the support of his conclusions, sometimes to the point of aggressiveness, his broad vision and lucid analysis have been generally justified by subsequent experience.

With a keen sense of responsibility to the owners of the North Western and an innate aversion to unclean practices, he protected his charge from the curse of stock speculation and manipulation. As a result, not one share of North Western stock has been issued during his administration except in exchange for hard cash. The wisdom of his course is vouched for by the high standing of C. & N. W. stocks today. Mr. Hughitt spent millions from both earnings and from capital to improve the physical condition of his line, a policy which cost him much criticism although time has proved the soundness of his judgment.

At the present time the North Western is one of the best maintained and equipped lines in the world. It has been double-tracked from Chicago to Omaha and almost all of the way from Chicago to St. Paul and Minneapolis, and has four tracks between Chicago and Milwaukee. The development of the road has been carried on carefully and steadily in conformance with the increasing transportation demands of the section of the country served. Extensions and improvements have been added from time to time to develop the maximum traffic and to enable it to be

handled with the maximum economy, with the double purpose of giving the public the best service it is possible to render and of making the property as profitable as possible to those who invested in it. While the North Western has not made investments without prospects of increased business, its management has generally anticipated the need for increased facilities.

The company has felt that its responsibility consisted of performing the best possible service and providing such extensions and improvements as were justified by the growth in population and production of the territory it traversed. It has not initiated new projects when existing facilities sufficed. This sound business policy is illustrated by the fact that Mr. Hughitt never allowed himself to be tempted into building an extension to the Pacific coast. The North Western for years has had satisfactory through traffic arrangements with the Union Pacific and other Harriman lines; the construction of a line to the coast would have made it a competitor of instead of a connection with those roads.



Marvin Hughitt

While the policy of the North Western has been careful and sound from a business point of view, it has not been ultra-conservative. When Mr. Hughitt became president in 1887 the total operated mileage of the North Western was less than 4,000 miles, while that of the Chicago, St. Paul, Minneapolis & Omaha was 1,340 miles. At the present time the North Western operates 8,108 miles and the Omaha 1,753 miles, while other subsidiaries have an operated mileage in excess of 300 miles.

As a consequence of its steady but never sensational development, the North Western has never been to any considerable extent burdened by unprofitable branches. Hardly a railway in the United States has a finer dividend record. It has never failed to pay a dividend in any year since 1878. From 1887 (when Mr. Hughitt became president) to 1894, it paid 6 per cent on its common stock; in 1895 it paid 4 per cent; from 1896 to 1899 it paid 5 per cent; in 1900 it paid 6 per cent, and ever since has paid 7 per cent.

Although Mr. Hughitt has not yet resigned as chairman of the board of the Chicago, St. Paul, Minneapolis & Omaha, it is understood that he will take such action as soon as the annual meeting of the stockholders of that road takes place. While resigning as the head of the board of the North Western, Mr. Hughitt is not giving up entirely his active connection with the company. He will continue to be a

director and a member of the executive committee of the road. Although he has passed his eightieth birthday, Mr. Hughitt retains all his faculties unimpaired.

Mr. Hughitt was born in Genoa township, Cayuga county, New York, on August 9, 1837. He entered railway service in 1856 on the St. Louis, Alton & Chicago, now the Chicago & Alton, which line he served as superintendent of telegraph and trainmaster. From 1862 to 1864, he was superintendent of the Southern division of the Illinois Central, following which he was promoted to general superintendent of the same road. In 1870 he was appointed assistant general manager of the Chicago, Milwaukee & St. Paul, and from 1871 to 1872, was general manager of the Pullman Palace Car Company. In 1872 he entered the service of the Chicago & North Western as general superintendent. He was promoted to general manager in 1876 and to vice-president and general manager in 1880. From 1887 to October, 1910, he was president of the road, and from the latter date up to the present time has been chairman of the board of directors. He has also served on the Chicago, St. Paul, Minneapolis & Omaha since 1882, when he was elected president. In 1907 he was elected chairman of the executive committee of that road, and from 1910 to date, has been chairman of the board of directors.

Arguments on the Standardization of Locomotives

Robert Quayle and C. A. Greenough Speak on the Question
at the Western Railway Club

AT A MEETING of the Western Railway Club held in Chicago on April 15, Robert Quayle, general superintendent of motive power of the Chicago & North Western and C. A. Greenough, vice-president of the Baldwin Locomotive Works, took occasion to make a few remarks on locomotive standardization in connection with a paper on Economy in Locomotive Operation and Maintenance. Mr. Quayle spoke in part, as follows:

"I want to say a word about the standard locomotives. I was a member of the committee of nine that was called on to prepare these designs. It was a big job to reconcile every member of the committee to each particular thing that was adopted. All the roads represented had their own standards, and they were all different. Many had to give up the fancy notions they cherished and had to take up notions of someone else, in order that the committee might agree. As a member I want to say that each man on that committee did his job splendidly. We saw that we could not bring in localism or sectionalism; what we did had to be for the good of the nation. It was essential that we get together and do what we could to help out. It is such sacrifice that brings results, and when men are ready to give up in order that democracy may prevail, we will get results."

Mr. Greenough presented arguments for and against standardization, his remarks being given practically verbatim as follows:

"The recent change in the controlling power of railroads has brought about the possibility of experimenting along lines which have long been under contemplation, but have been deemed outside the realms of the possible. I refer to the proposed standardization of the locomotive as a unit. The railroad administration, primarily to reduce the first cost of locomotives and with a view to effecting an interchangeability in repair parts which would enable locomotives to be transferred conveniently from one section of the country where transportation might reach a low ebb to another more congested district, has through conferences with the builders and the railroad committee proposed to bring about a series of standard locomotives. The committees appointed have done their work efficiently and there are under consideration twelve designs of locomotives, in some

cases two of a single class, one heavy and one light. The heavy locomotives are designed to develop the greatest average efficiency possible with a weight limited to 60,000 lb. per driving axle, while the light locomotives are limited to 55,000 lb. per driving axle.

"The arguments in favor of such standardization are in-

"Back Up Your Own"

By George A. Post

President of the Railway Business Association

"Back up your own by purchasing Liberty Bonds." That is what the Railway Business Association at its Chicago convention said to the railway supply craft, more than 50,000 of whose men are reported in the service of the United States.

Wherever American citizens are cooperating in projects for the common weal there will you find members of the railway supply craft. They are among the liveliest leaders and members of the community loan drive teams. It will be our pride to carry the subscriptions from our ranks up to the full measure of our means.

terchangeability between railroads, the possibility of some rapidity of construction, interchangeability of repairs and a somewhat lower cost. It is probable that the possibility of greater rapidity of construction has been lost for this year, because of the length of time which the administration has required to give consideration to the project. We could doubtless have built a larger number of locomotives, exact duplicates of those now on the railroads, had orders been placed two months ago, in a shorter time than we will be able to build the new types of locomotives, details concerning which are not yet settled.

"The arguments against standardization may be summed up as follows: The capacities of the locomotives are based upon average conditions; hence there is no provision for the extreme requirements which these locomotives do not cover. Where even the light locomotives are too heavy for service and where the heavy locomotives are not of sufficient capacity special locomotives will have to be provided unless those requiring lighter engines purchase from other roads discarded power, and those requiring the heavier locomotives change their system of operation so as to use the heavy standard government locomotive. In such instances where railroads have been equipped from one end to the other to use power of maximum capacity for the purpose of reducing train movements such action would prove a negative economy.

"The standard locomotives are designed for bituminous coal fuel and radical changes in their construction will be required for burning anthracite or an appreciable percentage of anthracite or for properly burning pulverized fuel. Oil fortunately requires no basic change. The limiting sizes of the locomotives of length, height and width must necessarily conform to the minimum to be found on the various roads over which the locomotives are designed to operate. These restrictions necessarily cramp the designs and limit their efficiency to the restrictions of the fuel. A limit of height of 15 feet has been proposed for all except the heavy Santa Fe and consolidation Mallet type locomotives; consequently steam space, domes and smoke stacks are mere shadows of what they would naturally be. In a country

as large as ours various physical and climatic conditions exist which the proposed standardization ignores; consequently the locomotives will afford maximum efficiency in some localities with a corresponding loss in others.

"No standardization of this extent has been dreamed of in the past; hence the task is relatively momentous. The Pennsylvania has for years given serious consideration and effort to the standardization of their equipment; likewise the Harriman Lines in 1905 proposed a series of standard locomotives for all roads controlled by them. Both of these efforts have resulted in an extensive standardization of parts, but not in a complete standardization of equipment, because growing needs for larger and more efficient power and the improvements in the permanent way have invited and made possible increases in the size and capacity of locomotives which have thrown to the winds any idea of standardization of locomotives which would extend over an appreciable period of time. In both instances the standard locomotives of today bear no comparison to the standard locomotives of ten years ago. The conservation of our resources will not permit of a system of standardization which is so inflexible as to choke further improvements and thus discourage the inventions which may now be in their incipency. Yet how can we maintain a standard which is permitted to change, and how can we progress without change. If standardization of locomotives as units is a war measure; if it will help us win, let us have standardization quickly and regard it as a war measure; but if it is an economic experiment the final net result may be the addition of just so many classes of locomotives to those now existing.

"The ideal standardization provides for the elimination of unnecessary diversity and progress invites and necessitates diversity, hence in spite of our ideals the standardization of locomotives may be limited to the standardization of the maximum number of parts.

"The problem now before the administration is to decide whether or not the criticisms in favor outweigh those against the proposed standardization, and we all await the decision with the keenest interest, and we all hope the decision, whatever it may be, will prove for the best."



Central News Photo Service

Small Ammunition Train on the Western Front

General News Department

The use of coal from Alberta, by the Grand Trunk Pacific Railway, will this year be more than twice as extensive as last year, orders having been given recently for 600,000 tons.

The car builders held another conference with John Skelton Williams, Wednesday and adjourned to meet again on Thursday without reaching any settlement on proposed contracts for freight cars.

Several railroads have turned over to the Railroad Administration the excess revenue earned by them since January 1; that is to say, the net revenue above their estimate of the amount of compensation due from the government.

The United States War Department has ordered for use in France 80 light locomotives, 60 centimeter gage, weighing 35,000 lbs., from the Davenport Locomotive Works, also 67 50 h.p. and 70 35 h.p. gasoline locomotives from the George P. Whitcomb Co.

Twenty-four inches of snow, reported at Sand Patch, Pa., on April 11, is supposed to be the final kick of the winter. The reports say that gangs of workmen had to be sent out with shovels to release 150 cars of coal at several points on branches of the Baltimore & Ohio.

Floors, good and bad, are the subject of the latest "Safe Practices" pamphlet, issued by the National Safety Council, Chicago. This is an eight-page leaflet, numbered 11, with numerous illustrations. It gives in detail the requirements of a good floor, and the dangers of broken, obstructed, slippery or uneven floors.

The Chesapeake & Ohio Employees' Magazine has been discontinued. The March number will be the last to be issued for the present. The meetings of the Safety First committees and such other data as it may be found advantageous to distribute in the interest of safety-first work will be published in some other manner.

Thomas Riggs, Jr., has been confirmed as governor of Alaska. The Senate took this action on recommendation of the Committee on Territories, which had delayed action until it had investigated charges made by J. E. Ballaine, of Seattle, Wash., who had alleged that Mr. Riggs, as a member of the Alaskan Railroad Commission, had been guilty of mismanagement in the construction of the Alaska railroad.

The United States Steel Corporation is expending from \$13,000,000 to \$14,000,000 a month on extensions to plants, almost all of which are for war work, according to the statement of Judge E. H. Gary chairman of the board of directors, at the annual meeting held in Hoboken, N. J., Monday. Mr. Gary said that the company would be able to continue the present dividends in addition to making the above expenditures from profits.

The quantity of rails needed by different important railroads has been under discussion both in the Railroad Administration and in the War Industries Board, and also the capacity of the mills to produce the rails in connection with other requirements of the government. It is understood to be probable that the amount of open-hearth rails must be reduced because of the amount of open-hearth steel required for munitions, and that the railroad companies have been asked through the regional directors to report as to what extent Bessemer rails can be used for all but important main track lines.

The Engineering Council, Engineering Societies building, 29 West Thirty-ninth street, New York, is compiling a calendar of conventions and other important meetings of engineering and related societies in order that information may be available in one place for the answering of inquiries and that the unnecessary conflict of dates be avoided. To assist in making this calendar complete and keeping it up to date, secretaries of engineering and scientific organizations are requested to send in-

formation about the time and place of proposed conventions and annual meetings to the secretary of the Engineering Council as early as practicable.

Charles M. Schwab, chairman of the Bethlehem Steel Company has been appointed Director General of the Emergency Fleet Corporation. At the suggestion of Charles Piez, the position of general manager, which he held, will be abolished in order that Mr. Schwab may be wholly unhampered in his control of production at all yards doing work for the Emergency Fleet Corporation. Mr. Piez still retains his position as vice president of the corporation. Mr. Schwab is said to have assured the President, at a White House conference preceding the announcement of his appointment that there would be no lack of steel for the carrying out of the ship-building program.

The Third Liberty Loan

Reports received up to noon, April 17, show that 281,958 officers and employees of western lines have subscribed for a total of \$21,817,835 in Liberty Loan bonds; this is an increase in subscriptions of \$4,153,150 in 24 hours, and an increase of 54,775 subscribers. The Rock Island System still leads the list with subscriptions amounting to \$2,487,200, representing 90 per cent. of its employees. W. G. Bierd, chairman of the loan committee, western lines, predicts that by Saturday the western roads will have subscribed for \$30,000,000, or one per cent. of the total loan.

Valuation of Telegraph Companies

The Interstate Commerce Commission has instituted an investigation on its own motion of the property owned or used by the telegraph and cable properties of the Mackay system, the value of the property and the history and organization of the companies. The order covers increases or decreases of stocks, bonds or other securities in any reorganizations; moneys received by any of the corporations by reason of any issues of stocks, bonds or other securities; the syndicating, banking and other financial arrangements under which such issues were made and the expenses thereof; net and gross earnings; the expenditure of all moneys and the purposes for which the same were expended, and any other transactions which may give any information as to the history or present value of the property.

Publicity for Crossing Dangers

The expenditure of \$275,000, to carry on a campaign of publicity for the prevention of accidents at highway grade crossings, is the main topic of a circular which has been issued by the Steam Railroad Section of the National Safety Council, and the author of which is H. E. Reisman. Mr. Reisman presented his argument to a meeting of the Chicago Steam Railways Claim Conference on January 7 last. He would extend his campaign over a period of four months and would make use of 300 Sunday newspapers and 5,000 billboards. He estimates that about three-fourths of the population of the country live in 23 states and that by the use of the newspapers mentioned, together with two or three agricultural papers, he would reach a large portion of the population of the country. He says that the number of automobiles and auto trucks in use in the United States on December 31 was 5,148,063, and that about 86 per cent of these cars were registered in the 23 states, which contain over 72,000,000 of population.

Observing that the New York Central, the Union Pacific, the Southern Pacific and the Santa Fe spend annually from \$400,000 to \$600,000 each for advertising and that the estimated expense of his propaganda amounts to not much more than \$1 per mile of road, he thinks that the scheme should be accepted as very reasonable. He thinks that the saving will

be great, for the number of casualties at grade crossings is increasing. In 1917 the figures were nearly 100 per cent greater than in 1916, and he looks forward to nearly the same ratio of increase in 1918. Calculating the total number of casualties this year at between 3,000 and 4,000, he thinks that the railroads will have to pay from six millions to eight millions of dollars on this account; and any campaign which should reduce or check this loss, even in a small degree, would be a handsome success.

A Railroad Builder of 1830

The Baltimore & Ohio Railroad was opened for business (for 15 miles, Baltimore to Ellicott Mills) in May, 1830, almost eighty-eight years ago; yet the Baltimore & Ohio Employees' Magazine prints the portrait of a man, now living, who took part in the construction of the track! This man is John Bottomley, of Franklin, Ky. However, he is not a centenarian; his work on the road was carrying water and luncheons to his father, who was a stonemason, engaged in making and laying the stone blocks which served as supports for the rails; and the boy, now 92 years old, was then only four. It is not to be supposed that his name appeared on the payroll; but no one who is familiar with railroad officers' biographies will deny that then, as now, a water boy was an important figure in railroad construction work. Railroad managers, and presidents, whose first railroad position was that of water boy, are quite familiar figures in American railroad history.

Urgent Calls for Stenographers at Washington

The United States Civil Service Commission is making a nation-wide campaign to obtain candidates for typewriter operators and stenographers, numbers of new places being announced daily in connection with the great expansion of government work. Women are being engaged in large numbers and many more or wanted. Persons who need further training to fit them for the work are appealed to to take, without delay, whatever instruction may be needed. Examinations are held in 450 principal cities of the country every Tuesday. The pay is from \$1,000 to \$1,200 a year, and competent operators are assured reasonably rapid promotion. Information in regard to the scope and character of the examination can be had from the Civil Service Commission at Washington, or from the examiners at Boston, New York, Philadelphia, Atlanta, Cincinnati, Chicago, St. Paul, St. Louis, New Orleans, Seattle, San Francisco, Honolulu and San Juan.

Machinery and Tool Convention

The enormous problem of manufacturing and supplying machinery and tools sufficient for the carrying out of the government program for the production of ships, shells, guns and aircraft will be the subject considered at the great "War Convention" of the machinery, tool and supply industry of the country to be held in Cleveland the week of May 13.

One thousand men who are bearing the brunt of the unprecedented demand for machinery will gather from all parts of the country to lay out a plan, with the aid of government officials, to keep the great munition program going at top speed. The big war convention will be a joint meeting of four great national associations, the American Supply & Machinery Manufacturers' Association, the National Supply & Machinery Dealers' Association, the Southern Supply & Machinery Dealers' Association and the National Pipe & Supplies Association, which will meet together in order to co-ordinate their efforts toward one goal, "More Ships, More Shells."

The Railway Regiments' Tobacco Fund

Samuel O. Dunn, secretary of the Railway Regiments' Tobacco Fund, has received a letter from R. L. James, first lieutenant and acting adjutant of the Seventeenth Engineers (Railway) Regiment, now in France, dated March 16, acknowledging receipt of a shipment of tobacco which has been distributed among the men. He said in part: "We appreciate very much the kindness of the different railroad organizations who are participating in making these tobacco shipments to the railroad men here in France. The supply of tobacco in France is limited,

and for that reason all tobacco received is all the more acceptable. We all thank you very much."

A letter has also been received from Morton Russell, captain adjutant of the Eighteenth Engineers (Railway) Regiment, written by order of Colonel Cavanaugh, acknowledging receipt of three cases which contained twelve 20-lb. packages of tobacco, which have been distributed to the regiment; and expressing the appreciation of the men in that unit.

Canadian Government Orders Rails

The Minister of Railways of Canada has ordered 100,000 tons of 85-lb. steel rails from the Dominion Iron & Steel Company, Sidney, N. S., for distribution among the four principal railways of Canada. Rolling was begun on April 1, and will continue at the full capacity of the mill until the entire order is completed. It is understood that the rails are being rolled on a cost plus percentage basis. The Canadian Pacific will receive 300 miles, the Canadian Northern 170 miles and the Grand Trunk and the Canadian Government 140 miles each of these new rails.

The Minister of Railways has also bought for the Dominion Government 37,375 tons of steel rails, which were rolled in the United States for the Russian Government, but which were not sent to Russia. These rails have been stored at the Atlantic seaboard for several months. They are of a section weighing 67½ lb. to the yard, and will be sufficient to lay approximately 355 miles of track. These rails will be laid in branch lines and sidings on the Canadian Northern and the Canadian Government Railways, to release heavier rails which will be transferred to main lines.

Railway Revenues for February

A preliminary bulletin of the revenues and expenses of 117 roads for February shows railway operating income of \$6,242,415 as compared with \$24,095,466 in February, 1917, which was one of the most unfavorable months in railroad history. In the month of January preliminary returns for 172 roads showed a deficit of over \$2,000,000. If a similar result is shown by the complete figures this will be the first time that the railroads have failed to pay operating expenses and taxes for a month since the monthly reports of the Interstate Commerce Commission were begun, in 1907. For the first two months of the calendar year the 117 roads for which the February returns are issued had operating income amounting to \$4,202,629 as against \$64,932,558 in 1917. To earn the compensation proposed to be guaranteed to the railroads on the estimated basis of \$945,000,000 for the year would require an average operating income of about \$78,000,000 a month, so that it is apparent that the Railroad Administration has begun the year with a heavy handicap. Operating revenues of the 117 roads, which operated 138,000 miles of line, amounted to \$166,034,510, as compared with \$151,906,989 in 1917. In January operating revenues showed a decrease. Expenses in February increased by over \$30,000,000, from \$129,089,920 to \$151,520,130. The two months' figures for the same roads show an increase in revenues from \$324,000,000 to \$329,000,000, while expenses increased from \$244,000,000 to \$308,000,000. The decrease in operating income of approximately \$60,000,000 in the two months is, therefore, practically due to increased expenses. The railroads of the eastern district show a deficit of \$4,869,418 for February and of \$14,038,785 for the two months. With a reduction of approximately \$6,000,000 in revenues, the eastern roads for the two months failed to pay operating expenses by nearly \$8,000,000.

Track Labor on Western Lines

As the result of a general conference of interested lines, the regional director of Western railroads has issued a number of instructions with reference to the employment of track labor during the present season. All lines are asked to make the fullest use possible of the United States government labor agencies. The standard day for all track labor will be 10 hours and the maximum rate of pay as follows: Central territory, 25 cents per hour; southwestern territory, 25 cents per hour; northwestern territory, 27½ cents per hour; all large terminals, 27½ cents per hour, and overtime pro rata. The present rates of pay will not be increased except in cases of necessity on account of the shortage

of labor, and when so increased will not exceed the maximum rates above specified. No allowances of any kind will be made for board or for any other reason that will have the effect of increasing compensation. Lines now paying higher rates in certain localities may, if they so desire, continue these rates, but there must be no extension of such excess rates. Laborers called for night service after being relieved from duty or performing Sunday inspection will be paid a minimum of five hours. Roads now paying or under contract to pay track men time and a half for Sunday and night work may continue this practice, and other roads in the same territory may adopt the same practice if they so desire.

It is essential for good service that clean, sanitary housing conditions for extra gangs or floating labor be provided. For this purpose railroads may provide at laborers' rates one man for every 75 men, or less, for the proper upkeep of the camps and also for one night watchman. For each gang of 10 men one cook may be allowed, and for each additional 25 men one waiter may be added. Railroads may transport free of charge food and essential camp supplies necessary, but this will not include food supplies for other than men employed in the camps, and does not include commissary supplies sold to the men.

Payment of the fare for laborers from the labor markets to the points needed and their return fare to the point where employed may be continued. The practice of labor agents recruiting laborers from the forces of any other roads is prohibited.

Preference List for Fuel Distribution

The War Industries Board of the Council of National Defense has issued a statement announcing the adoption by its Priorities Board of Preference List No. 1 for the guidance of all governmental agencies in the supply and in the distribution, by rail or water, of coal and coke. The board has not undertaken to classify any industry as non-essential or at this time to limit the quantity of fuel which any particular industry or plant shall receive; but it has listed certain industries whose operation is of exceptional importance, measured by the extent of their direct or indirect contribution, either toward winning the war or toward promoting the national welfare; and these industries will be accorded preferential treatment by the Fuel Administration in the shipment of coal and coke, and also in the transportation of such coal and coke by the railroads. The same plan will be followed in according preferential treatment to war industries and plants in the transportation of raw materials and supplies required by them in their manufacturing operations. The list as issued is not complete, but provision is made for certifying additional classes of industries and also individual plants whose operations are necessary as a war measure.

In determining what industries or plants are entitled to be certified, it is stated that two factors will control: (1) The relative urgency of the use or purpose for which the product is utilized, and (2) the per cent of the product utilized in war work or work of exceptional or national importance. No plant a very substantial per cent of whose product is not of exceptional importance can be accorded preferential treatment. No distinction is made between any of the industries or plants which are or may be included in the preference list, and no significance attaches to the order in which the industries or plants appear in the list. The list includes railways and shops making locomotives, freight cars and rails, and other plants engaged exclusively in the manufacture of railway supplies. It also includes the following: Aircraft, ammunition, army and navy cantonments and camps, arms, chemicals, coke plants, domestic consumers, electrical equipment, electrodes, explosives, farm implements, feed, ferroalloys, fertilizers, fire brick, food, food containers, gas, guns; hemp, jute and cotton bags, insecticides, iron and steel, laundries, machine tools, mines, newspapers and periodicals, oil, oil production, public institutions and buildings, public utilities, railways, plants manufacturing railway supplies, refrigeration, seeds, ships, shipbuilding plants, soap, steel, tanners, tanning extracts, tin plate, twine and rope, and wire rope and rope wire.

WANTS ARMY OF SAVERS.—The purpose of the War Savings Committee is to create an army of savers who will, by saving, release labor and materials for the use of the Government in the war, and who will lend their savings to the Government to prosecute the war.

Traffic News

J. Van Dyke Norman, an interstate commerce attorney, addressed the Transportation Club of Louisville at a noon day luncheon on April 8, at the Henry Watterson hotel, Louisville, Ky., on "Government Operation of Railroads."

In a circular under date of April 12, the regional director of Western railroads announces new routes and schedules for the movement of fruit and vegetables from California points to Chicago. This traffic will move in trains consisting of a minimum of 25 cars from various concentrating points in California. Under the plan, all carloads of fruits and vegetables loaded in time to reach the proper concentration point before the time of departure will arrive in Chicago in time for morning team track placement, including delivery to auction houses, on the ninth day from loading station.

The Department of Agriculture announces that United States standard containers must be used for fruits and vegetables shipped this year in interstate traffic. That is to say, all packages must conform to the provisions of the United States Standard Container Act. The baskets, crates, hampers and boxes must be in sizes containing half-pints, pints, quarts or multiples of quarts; though slight variations, either over or under size, may be allowed provided the average for any shipment conforms to the standards. Many manufacturers have arranged to make no containers except those that comply with the statutory requirements, and even shippers whose products are usually consumed in their own state are said to favor packages complying with the federal law.

Live Stock Receipts

Receipts of live stock at markets in the western district, as reported by the United States Railroad Administration for the month of March were approximately 44 per cent greater than during March, 1917.

The receipts in carloads, were as follows:

| | 1918 | 1917 | Increase |
|-------------------|--------|--------|----------|
| Chicago | 28,731 | 17,417 | 11,314 |
| St. Paul | 5,150 | 4,162 | 988 |
| Omaha | 12,445 | 9,322 | 3,123 |
| Sioux City | 7,433 | 4,791 | 2,642 |
| St. Joseph | 5,774 | 4,093 | 1,681 |
| Kansas City | 10,921 | 8,285 | 2,636 |
| Denver | 2,112 | 1,500 | 212 |
| Milwaukee | 1,037 | 912 | 325 |
| | 73,603 | 50,882 | 22,921 |

Coal Production

A decrease of 1,500,000 tons in the total output of bituminous coal during the week ending April 6, or 14 per cent as compared with the preceding week, as reported by the Geological Survey, has brought out an exchange of statements from the Fuel and Railroad Administrations as to the coal situation. The coal production for the week, including lignite and coal made into coke, was estimated at 9,395,000 net tons. The decrease was attributed by the Geological Survey partly to the observance of Mitchell day, April 1, the anniversary of the enactment of the eight-hour law, as a holiday. It is also understood that April 6, the day of the opening of the Liberty Loan campaign, was observed as a holiday in many districts. A chart showing the average total production per working day of bituminous coal, including coal coked, published with the report, shows an almost steady increase from January 19 to March 30, but a falling off for the week ending April 6 to the lowest point since last June with the exception of the week of December 15 and the week of January 19. The percentage of full time output reported for the week ending March 30 was 66.2 per cent, and of the loss 23.3 per cent was attributed to car shortage. Complaints of the effect of increasing car shortage on the production of coal have been renewed by the representatives of the Fuel Administration during the past week, but no statement was made by the Railroad Administration until Monday, when, after Dr. Garfield had issued a

statement referring to the Geological Survey figures and attributing it to shortage of cars, the Railroad Administration issued a statement showing that up to April 6 the railroads had handled this year 6,441 cars of coal more than was handled during the corresponding period of 1917, in spite of the decrease of 79,172 cars in January.

At a conference of the state fuel administrators from all states east of the Mississippi, held at Washington on April 11, a resolution was unanimously adopted and presented to the United States Fuel Administrator, stating that due to the present over-burdened condition of the railroads, unless effective measures of relief are at once taken the supply of coal ore for the coal year beginning April 1 will fall seriously short of the needs of the country. All individuals, industries and communities were called upon unselfishly to endorse and support such acts of the government as may be needed to clear the railway tracks of any unimportant or unnecessary traffic congesting the railways and interfering with the prosecution of the war.

The National Coal Association also issued a statement stating that bituminous coal production during the first three months of 1918 has failed to keep pace with the growing demands of industrial and domestic users and that reports from virtually every bituminous field in the United States show that mine operations have been restricted by the lack of railroad cars.

In his statement Dr. Garfield said, "A large part of the shortage is due to the continued lack of transportation service as evidenced by the shortage of cars placed at the mines to be loaded. This is due to the general pressure of war traffic on the railroads. Continued shortage of cars at the mines in the fields supplying the eastern industrial territory has had the effect of keeping mine labor idle for days at a time and in some of the fields has cut the working time to one or two days a week. The Fuel Administration is gravely apprehensive lest this condition result in the complete demoralization of the labor supply of the bituminous mining industry. The Fuel Administration is convinced that unless there is immediate and material improvement in car supply efficiency the country faces the certainty of a serious shortage of coal." Among the causes of disturbance curtailing production, Dr. Garfield referred to the unsettled situation regarding contracts for railroad fuel. He said this question is under consideration by the Railroad and Fuel Administrators and will be settled at the earliest moment possible.

The Railroad Administration statement showed the number of cars of coal of all kinds loaded on all lines during the months of January, February, March and for the first week in April, for the years 1918 and 1917 comparatively, as follows:

| Month of January— | | 1918 | 1917 | Inc. or Dec. |
|----------------------|-----------|-----------|------------------|------------------|
| Anthracite | 127,049 | 140,927 | D | 13,878 |
| Lignite | 19,707 | 16,870 | I | 2,837 |
| Bituminous | 658,236 | 726,367 | D | 68,131 |
| Total | 804,992 | 884,164 | D | 79,172 |
| Month of February— | | 1918 | 1917 | Increase |
| Anthracite | 143,766 | 136,882 | | 6,884 |
| Lignite | 17,475 | 15,300 | | 2,175 |
| Bituminous | 727,710 | 705,519 | | 22,191 |
| Total | 888,951 | 857,701 | | 31,250 |
| Month of March— | | 1918 | 1917 | Inc. or Dec. |
| Anthracite | 210,076 | 201,665 | I | 8,411 |
| Lignite | 13,189 | 16,269 | D | 3,080 |
| Bituminous | 960,202 | 918,920 | I | 41,282 |
| Total | 1,183,467 | 1,136,854 | I | 46,613 |
| First Week in April— | | 1918 | 1917 | Inc. or Dec. |
| Anthracite | 43,642 | 41,526 | I | 2,116 |
| Lignite | 2,083 | 2,744 | D | 661 |
| Bituminous | 187,463 | 181,168 | I | 6,295 |
| Total | 233,188 | 225,438 | I | 7,750 |
| Year to date— | | | Decrease Cars | Increase Cars |
| Month of January | | 79,172 | | |
| Month of February | | | | 31,250 |
| Month of March | | | | 46,613 |
| First week in April | | | | 7,750 |
| Total | | 79,172 | | 85,613 |

It was stated that the unprecedented weather conditions in January were responsible for the decrease in coal loading in that month and that notwithstanding the very heavy loss in loading in January, the loading since has increased until the production, at the end of the first week in April, shows an increase over last year of 6,441 cars.

Commission and Court News

Interstate Commerce Commission

The commission has approved the application of the Pennsylvania and Baltimore & Ohio to increase storage charges by reducing free time allowed on less than carload freight at Philadelphia.

The Interstate Commerce Commission has issued supplemental orders by which the increases of not to exceed 15 cents a ton on anthracite coal allowed in its orders of March 12 will apply to points in Official Classification territory and Canadian points not covered in the original order.

Fifteenth Section Application No. 3380 filed by Agent E. B. Boyd seeking authority to increase rates on hay and straw due to the cancellation of commodity rates in Western Trunk Line territory and the application of class rates in lieu thereof has, by direction of the commission, been placed on the formal docket and has been given docket No. 10100.

Application for a general investigation of the rates on petroleum and its products has been made to the commission by the National Petroleum Association, Western Refiners' Association and the Western Jobbers' Association, which also asked for a postponement of the operative date of the commission's decision in the supplemental 15 per cent case.

Fifteenth Section Application No. 3307 filed by E. B. Boyd as agent to increase rates on lumber and articles taking same rates, from points in Minnesota, Wisconsin, the Northern Peninsula of Michigan and Canada to Chicago, Racine, Milwaukee, Manitowoc, Sheboygan and related points, has, by direction of the commission, been placed on the formal docket and has been given docket No. 10099.

Fifteenth Section applications filed by western railroads for authority to establish the same rates on nut coal as applies on lump coal from Colorado, Wyoming and New Mexico mines on the lines of these carriers to all destinations in Nebraska, Iowa, Kansas, Missouri and Oklahoma, and to certain points on the Chicago, Burlington & Quincy in Nebraska, have been consolidated and assigned to the formal docket under Docket No. 10117.

Fifteenth Section Application No. 570 filed by Agent Gomph to increase rates on forest products from points in Oregon, Washington, California and Nevada to points on the Atchison, Topeka & Santa Fe, in California, has by direction of the commission been assigned to the formal docket to be considered and disposed of in connection with the record made in I. & S. docket No. 912, which proceeding has been reopened for further consideration.

The commission has ordered an investigation into the rates and practices of common carriers governing transportation of petroleum and its products between points in official classification territory, with a view to prescribing just and reasonable rates. The recent increases in the rates on these commodities include wide variance in the amount and percentages of increase as between various localities and complaint has come to the commission concerning both the amount of the increases and the changes in relationship.

Fifteenth Section Application No. 4560 filed by carriers, for whom F. A. Leland is agent, for authority to cancel the effective commodity rates on pressed cloth, in carloads from Houston and Houston Heights to Memphis, Tenn., and from Clinton, Fidelity, Houston, Houston Heights and Port Houston, Texas, to Algiers, New Orleans and other points, class rates to apply in lieu thereof, has by the direction of the commission been assigned to the formal docket and will be set down for hearing as soon as the engagements of the commission will permit.

The commission is to investigate carload minimum weights on lumber and lumber products in all parts of the United States. Carriers serving North Pacific Coast points and points in the "inland empire" have prescribed carload minima based on the

cubical capacity of the cars, while carriers serving other lumber producing regions use other minima. There have been numerous complaints as to discriminations caused by this difference and by difficulties as to the application of rules based on the cubical capacity; and the commission will seek to ascertain whether the variations are reasonable.

Fifteenth Section Application No. 2516 filed by the Pennsylvania Railroad Company for itself and on behalf of other carriers participating in its tariffs for authority to cancel the present water competitive rates on certain kinds of lumber, and to apply in lieu thereof the so-called normal lumber rates applicable on forest products, and Fifteenth Section Application No. 2530 filed by Agent Chalenor in behalf of Southern Lines, also seeking authority to cancel water competitive rates on certain kinds of lumber and to apply in lieu thereof the normal lumber rates, have, by direction of the commission, been consolidated under formal docket No. 10098, and will be set down for hearing as soon as the engagements of the commission will permit.

The Interstate Commerce Commission has ordered a hearing to be held at the Hotel Sherman, Chicago, on April 22, before Examiner R. H. Kimball, on the protest of the New Orleans, Texas & Mexico to the tentative valuation of its property made by the Division of Valuation. The hearing will be devoted to all matters drawn in question by the protest, except matters pertaining to land. At the conclusion the hearing will be adjourned to some point on the lines of the road where evidence will be received on values and classification of lands, but no evidence will be received as to cost of condemnation and damages or of purchase. All parties are expected to produce their entire evidence at these hearings.

State Commissions

The Railroad Commission of Georgia has authorized an increase of $2\frac{1}{2}$ mills a mile in the prices of thousand-mile tickets, making the rate \$22.50. The new rate goes into effect May 1. A similar increase has been authorized in the prices of party tickets. Books of two thousand miles will no longer be sold. For interstate travel, the \$22.50 rate already prevails.

Court News

Excessive Damages

The Texas Court of Civil Appeals holds that where a conductor, on the ground that his ticket had expired, ejected an aged man, whose ticket was valid, at a point six miles from the station, on a dark night, in a driving rain, and he suffered mental anguish and fear, and was threatened with pneumonia, though not confined, a verdict of \$2,000 was excessive, and was reduced to \$1,000.—*Houston East & West Texas v. Snow (Tex.)*, 201 S. W., 224. Decided February 15, 1918. Rehearing denied March 6, 1918.

Service of Process on Station Agent

The Kansas Supreme Court holds that where a railroad has been placed in the hands of a receiver under an order directing him to take into his possession and control all the assets and property of the corporation and to operate the railroad, service of summons, in an action against the railroad corporation, upon a station agent who is in the employ of the receiver and had formerly occupied the same position for the corporation, is not good service as to the corporation. The same question has arisen in a number of cases. The decisions, however, are controlled by statutes, some of which differ from the Kansas statute as to the manner of service on a railroad company.—*Chillett v. M. K. & T. (Kan.)*, 171 Pac., 14. Decided January 12, 1918. Rehearing denied March 15, 1918.

Employees Crossing Tracks; Contributory Negligence

The Indiana Supreme Court holds that the rule which exacts of a traveler or other person about to cross a track the precaution to look in both directions, and also to listen, in order to ascertain whether a train is approaching, is not applied in all its strictness to railroad employees who are required to be on

or about such tracks, and the failure of such an employee, while in the discharge of his duties, to look and listen for approaching trains, may or may not be negligence under the particular circumstances of the case. Those who are engaged in the active work of railroad operation are not only required to be watchful and vigilant to conserve their own safety, but owe a similar duty to all others whose duties expose them to the same dangers; and all such employees have a right to rely to some extent on the care of each other and to assume that each one thus employed will use reasonable care to avoid injuring the others.—*Chicago & Erie v. Steele (Ind.)*, 118 N. E., 824. Decided February 27, 1918.

Expense of Crossing Another Railroad's Tracks

In an action by a street railway to recover from a railroad one-half the cost of renewing certain highway crossings where the tracks of the two companies crossed in a city, the Indiana Appellate Court holds that a contract whereby the railroad granted to the street railway right to forever maintain a single track across the tracks and right of way of the railroad in consideration that the street railway at its own expense maintain the necessary crossings, is invalid as against public policy, and in violation of the state statute providing that each company respectively shall keep and repair its own tracks so as at all times to provide a safe and convenient crossing. As the only consideration for the promise of the street railway to maintain the crossing was the privilege of crossing the railroad's tracks, a right which the former had without the latter's consent, there was no sufficient consideration to support a verdict.—*Vandalia v. Ft. Wayne, etc., Traction Co. (Ind.)*, 118 N. E., 839. Decided February 26, 1918.

Pennsylvania Stop, Look and Listen Rule

In an action against a railroad company for damages for injuries resulting from a crossing accident, the United States Circuit Court of Appeals, Second Circuit, says that the law of Pennsylvania, where the accident occurred, and which law governs the right of action, "makes it an obligation to stop, look and listen before crossing the tracks of a railroad company. This is not a rule of evidence, but a rule of law, peremptory, absolute and unbending, which the jury should never be permitted to ignore or evade or pare away by disjunctions and exceptions. Not to stop, look and listen is negligence per se. The decisions of the Supreme Court of Pennsylvania fully establish this." The plaintiff was struck in the nighttime by a train coming down grade by force of gravity merely. The train bore no light and the locomotive tender first. It was held that the plaintiff's testimony that he did stop, look and listen could not be rejected as incredible and contrary to the physical facts, and a verdict by the jury based thereon overturned.—*P. & R. v. Skerman*, 247 Fed., 269. Decided December 11, 1917.

Federal Employers' Liability Act Decisions

A railroad company engaged in intrastate and interstate commerce accepted the Michigan Workmen's Compensation Act, which, in part 6, §4, declares that the provisions of the act shall apply to employees and workmen engaged in intrastate commerce, and also to those engaged in interstate commerce or foreign commerce for whom a rule of liability, or method of compensation, has been or may be established by Congress only to the extent that their mutual connection with intrastate work may and shall be clearly separable and distinguishable from interstate and foreign commerce, but that any employer or employee may, subject to the approval of the Industrial Accident Board, and so far as not forbidden by any act of Congress, voluntarily accept and become bound by the provisions of the act. A conductor on one of the company's interstate trains suffered injuries resulting in his death. His wife instituted proceedings under the state Workmen's Compensation Act. The Michigan Supreme Court holds that, in view of the federal Employers' Liability Act, which was passed prior to the Compensation Act, and by which Congress indicated an intention to cover the whole field of compensation or relief for injuries suffered by railroad employees engaged in interstate commerce, no award could be made. The fact that the railroad accepted the act did not show a consent that the statute should apply to interstate

commerce transactions. Obviously the act might have been accepted by the company as applicable only to injuries arising out of intrastate commerce.—*Carey v. Grand Trunk Western* (Mich.), 166 N. W., 492. Decided February 19, 1918.

Where an engine has been specifically designated for a certain interstate train, and a hostler was told to fire and prepare the engine for such train, and while doing so was injured, he was held within the act.—*Cincinnati, N. O. & T. P. (Tenn.)*, 201 S. W., 128. Decided February 11, 1918.

A brakeman on a freight car loaded with cotton shipped to a point in another state, but to be taken to a point within the state to be compressed in transit, was held to be engaged in interstate commerce.—*Rock Island v. Hessenflow* (Okla.), 170 Pac., 1161. Decided March 5, 1918.

Condemnation Proceedings—Spur Track

Crossing Another Road's Right of Way

The Arkansas Supreme Court holds that damages in condemnation proceedings must be determined in the circuit court, the proceedings being strictly statutory and legal, and equity will interfere only when an attempt is made to take property for private instead of public purposes. In order to invoke equitable interference on this ground the cross-bill must state facts and not conclusions. A cross-bill in condemnation proceedings where a railroad was seeking to put a spur track across the right of way of another railroad, which stated that the purpose was only for private purposes and that the two roads were connected and had established switching charges, and that the defendant railroad could properly serve industries to be served by the proposed spur, merely stated conclusions, and did not give equity jurisdiction. It was also held that the evidence established the fact that the spur, when built, would be for a public use. It would serve several industries and the shipping public in a more convenient and expeditious manner. Decree dismissing the complaint was therefore reversed, and the cause remanded for the ascertainment by the circuit court of the damages to which the defendant railroad was entitled.—*Butler County R. Co. v. St. Louis, Kennett & Southeastern* (Ark.), 200 S. W., 1007. Decided February 11, 1918.

Duty to Record Delivery of Intoxicating Liquors

An express company was indicted for a violation of the Kentucky statute relating to the keeping of books recording particulars of the delivery of intoxicating liquors. The trial court sustained a demurrer to the indictment. The Kentucky Court of Appeals has set aside the trial court's order. The statute declares that the book to be kept shall be open to public inspection at any time during the business hours of the carrier and shall constitute prima facie evidence; failure or neglect to keep the record is a misdemeanor. An express company provided an appropriate book, but its local agent delivered liquors without requiring the consignee to sign his name. The Appellate Court holds that the carrier cannot avoid liability on the ground that its duty was fulfilled when it provided the book, and that the offense was committed only by the agent; the use of the disjunctive "or" in the penal provisions does not show any intent to relieve transportation companies and cast all burdens on their agents.—*Com. v. Adams Express Co.* (Ky.), 200 S. W., 648. Decided February 19, 1918.

State Commission's Authority at Crossings

The Oklahoma Supreme Court holds that the Corporation Commission has no authority to require the performance by railroads of public duties which have no bearing on or relation to the transportation of either persons or property, or which do not relate in any way to the transaction of business by the public with such companies. The attorney general complained before the commission that the defendant did not maintain safe and suitable crossings where its tracks crossed two certain avenues. It was not claimed that the condition of the crossing affected the safety of either persons or property on defendant's trains, or that the improvements sought were necessary for the use of the public in transacting business with the defendant company. The commission made an order requiring the defendant to build a viaduct across one or the other of the two avenues.

It is held that the commission had no jurisdiction to make the order, and the railroad's application for a writ of prohibition was granted.—*Atchison, T. & S. F. v. Commission* (Okla.), 170 Pac., 1156. Decided December 15, 1917. Rehearing denied February 26, 1918.

Methods of Acquiring Rights of

Way and Station Grounds

Under the act of Congress (Act March 3, 1875, c. 152, 18 Stat., 482), a railroad company may acquire right of way by the actual construction of the railroad over the public domain; or, under the fourth section, the right of way and station grounds may be acquired by (1) location of the road; (2) filing a profile of it in the local land office; and (3) the approval thereof by the Secretary of the Interior. If, at the time the railroad seeks to appropriate public lands of the United States, such land is subject to entry and sale, the road is entitled to the benefit of the act, notwithstanding that such land may have been reserved from entry and sale at the date of the law (March 3, 1875). The status of the land at the date the appropriation is sought controls the right of the railroad company; not its status at the date of such act. The Supreme Court of New Mexico holds that the provision of section 4, requiring a profile to be filed, is directory, and a railroad may file such map and secure the benefits of the act after the stipulated period (12 months) has elapsed, if it so elects. The fact that it has completed its railroad does not prevent it from obtaining station grounds under the act if the land is public land, subject to entry and sale, at the time it applies therefor. The approval by the Secretary of the Interior of the filed profile is conclusive against collateral attack.—*Jackman v. Atchison, T. & S. F.* (New Mex.), 170 Pac., 1036. Decided January 14, 1918. Rehearing denied February 23, 1918.

Trespass on Adjoining Land—

Cutting Brush and Diverting Water

In a suit by an abutting owner against a railroad to enjoin trespass the evidence tended to show that brush left on the plaintiff's land was cut with her permission along the right of way by the railroad's agents, in order that a better view of a semaphore signal might be obtained by locomotive engineers. The Oregon Supreme Court therefore held that the cutting of the brush was not a trespass. If by leaving it on the land when it should have been burned after it was cut the land owner was injured her remedy was the expense reasonably to be incurred in removing it and not the damages which might result by reason of her inability to use the land for grazing. An action at law to recover the outlay thus necessitated affords an adequate remedy and no exigency exists for resorting to a court of equity. In changing its roadbed the railroad diverted the water of a brook so that it seeped through the embankment and damaged the plaintiff's land. It was held that such act constituted a continuing trespass; but as the plaintiff for seven years asserted no rights and sought no relief her long delay precluded equitable intervention.—*O.-W. R. & Nav. Co. v. Reed* (Ore.), 170 Pac., 300. Decided January 29, 1918.

Limiting Liability of Connecting Carrier

The Tennessee Supreme Court holds that an agreement by the agent of a carrier to pay damages, not occurring on its lines, to goods shipped under a bill of lading providing that no carrier shall be liable for loss other than on its own lines, is a discrimination against the uniformity of responsibility required of carriers of interstate commerce, and is unenforceable. The Carmack Amendment, making the initial carrier responsible for transportation to destination, does not preclude limiting the responsibility to the shipper by a connecting carrier to damages on its own lines, and such limitation is good at common law. A connecting carrier is not estopped by a promise to settle, to rely on a provision in a bill of lading limiting liability to loss occurring on its own lines, to defeat recovery on an unlawful contract made by its agent to pay such loss on interstate shipments. The carrier cannot waive the terms of the bill of lading contract. Under the acts of Congress it is unlawful for any shipper to receive any benefit or advantage to which all other

shippers are not entitled at the hands of a carrier. An estoppel cannot be invoked to obtain for a shipper an unlawful preference. —*Southern v. Lewis* (Tenn.), 201 S. W., 131. Decided February 11, 1918.

Government Control and State Commissions' Orders

The Oklahoma Corporation Commission made an order requiring the St. Louis-San Francisco to remove its present station in Miami and to replace it by a modern fireproof structure. The railroad appealed. Since the submission of the case in the Supreme Court the United States has taken control of the railroad, and the Supreme Court continued the cause until the further order of the court. The court said it knew judicially, as everyone knows, "that it will require the utmost conservation of the resources and energies of this country and will require vast stores of supplies and materials, such as will be required to comply with the order appealed from, to carry on the prosecution of the war to a successful termination, and that the revenues of the railroads, their rolling stock, and the services of their employees will be taxed to the utmost in the speedy and efficient transportation of troops, munitions, and other war supplies. Matters of this kind must and will have precedence over matters of private convenience and local ambition, and . . . we are of opinion that compliance with said order should be suspended until the further orders of this court."—*St. Louis-San Francisco v. State* (Okla.), 170 Pac., 1146. Decided February 12, 1918.

Reasonableness of State Commission's Rate Order

In response to a rule to show cause why the Oklahoma Corporation Commission should not issue an order providing that rates now charged for freight and passenger service shall not be advanced by any carrier until such advance is approved by the commission, several railroads appeared and filed a protest denying the jurisdiction of the commission to make such order. Thereafter, and without taking any extrinsic evidence tending to show the necessity for or reasonableness thereof, a final order was issued, providing that the railroads "shall not advance the rates now charged for freight or passenger service until such advance is approved by the commission and tariffs regularly filed with the commission." The Oklahoma Supreme Court holds that the order was a reasonable exercise of the power and authority conferred on the commission by the constitution and laws of the state, and invades no substantial right of the railroads, either state or federal. It also holds that the taking of extrinsic evidence is not necessary to support the order where its necessity and reasonableness are apparent from the mere statement of conditions contained in the record, of which the courts and the commission may take notice. The court adds: "Of course, this and all other general rules and orders of a similar nature promulgated by the Corporation Commission, prior to the taking over of the railroads by the federal government as a war measure, must be administered in the light of these changed conditions."—*Atchison, T. & S. F. v. State* (Okla.), 171 Pac., 43. Decided February 12, 1918.

Right to Maintain Snow Fences Along Highways

Action was brought against a railroad for the death of the driver of a sleigh by being precipitated from the top of a load of straw on the sleigh which he was driving along the highway adjoining the railroad. The accident happened when the forward part of the sleigh descended into a hole in the snow in the highway, overturning the sleigh and its load. The railroad maintained a tight board fence, about 7 feet high, along the division line between its road and the highway, to keep snow from blowing on the track. The highway passes over an elevation, and the tracks are in a cut from 4 to 6 feet deep. Prior to the building of the fence the snow did not drift into the highway at this point, but the effect of the fence was to cause the snow to drift and to a considerable extent obstruct the highway, contributing to the development of pitch holes between the drifts. The complaint charged negligence in maintaining the fence and thereby creating a nuisance. The question left to the jury was as to whether the fence was a nuisance, in that it obstructed the highway by causing an accumulation and piling of snow, which but for the fence would not have occurred. The precise question presented does not appear to have been

decided in any reported case, or to have been treated by any text-writer. From a verdict and judgment for the plaintiff the defendant appealed. The New York Appellate Division has reversed the judgment and dismissed the complaint. It holds that a railroad running alongside a highway may maintain snow guards on the line of the right of way, although they cause snow to drift in the highway, obstructing and making it dangerous, as anyone can erect structures wholly on his own land without incurring liability for its incidental effect on the adjoining highways or landowners. The court said:

"It would seem that the railroad companies would have the same right to erect fences and other structures upon their right of way as to raise embankments, although the effect of the embankment would be to cause snowdrifts in the adjoining highway. A farmer's barn may cause drifts in the highway, but it has never, so far as I am aware, been contended that this would subject the farmer to liability for creating a nuisance in the highway. All highway fences do tend to produce drifts, except, perhaps, the modern wire fence."—*Cooney v. Northern Central*, 167 N. Y. Supp., 865. Decided November 14, 1917.

Assignability of Contracts Between Railroad and Telegraph Companies for Maintenance of Wires

A telegraph company entered into a contract with a railroad company for the construction and maintenance of a telegraph line along the railroad right of way, the railroad company to furnish an easement over its right of way, furnish the labor and maintain and operate the line, giving office room at stations. Employees of the railroad were to act as custodians of moneys received for commercial messages. The railroad company became insolvent and the receiver operated the railway and telegraph systems, discharging the contract obligations of the railroad company. On the expiration of the receivership the property was sold to another railroad company and the court's order of sale, which included all rights of the railroad company as well as the rights of the mortgagees, gave the plaintiff 90 days in which to disavow contracts by its predecessors. After the purchaser took possession of the road it was notified by the telegraph company that it elected to terminate the contract on account of the foreclosure proceedings and threatened to discontinue service and remove its line. To prevent it from carrying its threats into execution the railroad company filed a bill for injunction. The questions involved were: (1) Was the contract between the telegraph company and the plaintiff's predecessor assignable? (2) Was the contract assigned?

The Michigan Supreme Court holds that as the contract was obviously made by the telegraph company to obtain a right of way for its telegraph system, and by the railroad to obtain a telegraph system for the operation of its trains, the contract was assignable; an executory contract not necessarily personal in its character being assignable when it can, consistent with the rights and wishes of the parties, be fairly and sufficiently executed as well by the assignee as by the original contractor. As the plaintiff did not within the 90-day period disavow liability on the contract, but instead used the telegraph system, which was essential to the operation of the road, the contract must be treated as having been adopted by the plaintiff, and hence the telegraph company could not after the expiration of the 90-day period rescind the contract on the ground that the insolvency of the original company destroyed the mutuality of the agreement. Moreover, as the telegraph company abided by the agreement while the road was in the receiver's hands, and made no attempt to disavow it on account of mutuality until he property had passed to the plaintiff, it would not, because inequitable, be allowed thereafter to disavow the contract on the ground of want of mutuality. Though the original railroad company had mortgaged its property before contracting with the telegraph company for the construction of the line, yet as the contract was assignable, and as the order for the sale of the railroad property contemplated not only the disposition of the rights of the mortgagees but of the rights of the railroad company and the receiver, the contract passed to the plaintiff, the purchaser at the sale. Decree for the plaintiff was affirmed.—*Detroit, Toledo & Ironton v. Western Union Tel. Co.*, (Mich.), 166 N. W. 494. Decided February 19, 1918.

Equipment and Supplies

Freight Cars

F. M. PEASE, Philadelphia, Pa., has ordered 500 tank cars from the Cambria Steel Company.

THE MUTUAL SALES COMPANY, Warren, Pa., is inquiring for 10 40-ton, 8,000-gal. tank cars.

THOMPSON & STARRET COMPANY, Charleston, W. Va., has ordered 400 gun cotton cars from the Kilbourne & Jacobs Manufacturing Company.

THE J. G. WHITE ENGINEERING CORPORATION, New York, is inquiring for 40 to 50 10,000-gal., 50-ton steel underframe tank cars for the Gulf Sulphur Company.

THE UNITED STATES GOVERNMENT has ordered 76 flat, 8 box, 4 narrow gage flat cars and 36 transfer trucks from the American Car & Foundry Company; and 10, 30-ton, insulated tank cars for the Ordnance Department from the American Car & Foundry Company. In addition the government is inquiring for 4, 75-ton steel flat cars for the Navy, and is asking for prices on 20, 40-ton flat cars.

Canadian Orders for Cars and Engines

A statement of recent orders for equipment, presented in Parliament at Ottawa on April 9, by Hon. J. D. Reid, Minister of Railways, shows the following contracts:

Canada Car & Foundry Company, 5,000 forty-ton steel frame box cars, \$13,750,000; National Steel Car Company, 1,000 cars, \$2,750,000; Eastern Car Company, 750 forty-ton flat cars, \$1,777,800; Eastern Car Company, 650 fifty-ton coal cars, \$2,066,675; Hart-Otis Company, 250 side-dump cars, \$760,000; Hart-Otis Company, 200 side and centre-dump cars, \$625,000; Pressed Steel Car Company, 25 general service tanks, \$134,956; Pressed Steel Car Company, 25 water service tanks, \$129,593; Canada Car & Foundry Company, 250 refrigerator cars, \$1,024,250; Pullman Car Company, 14 sleeping cars, \$502,460; Pullman Car Company, 7 dining cars, \$238,700; Montreal Locomotive Works and Canada Locomotive Company, 50 consolidation freight engines, \$2,900,000; 10 switching engines, \$405,000; 30 Pacific type engines, \$1,800,000; 60 Mikado type engines, \$3,720,000; Canada Locomotive Company, six switching engines, \$246,000; four narrow gauge engines, \$136,080. Total cost of all equipment ordered, \$32,966,515. This does not include the 100,000 tons of rails recently purchased.

In reply to a question, Dr. Reid said he might yet have to purchase ten or fifteen snow ploughs at a cost of \$100,000, while the National Railway Defense Association was asking him to buy 100 tourist cars for carrying troops. He might also have to purchase 19 baggage cars.

Iron and Steel

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA has ordered 112 tons of steel for the construction of deck and through plate girder spans for use at Palisade, Minn., and Waukesha, Wis.

Miscellaneous

CHICAGO, BURLINGTON & QUINCY.—This company has ordered six 150-ton steel coal chutes from the Ogle Construction Company, Chicago, to be installed at Clayton, Wyo., Powder River, Orin Junction, Echeta, Lysite and Seneca, Neb.

Signaling

THE SOUTHERN PACIFIC has ordered 50 automatic block signals, Union, style B, two-arm, to be kept in stock to fill short-notice requisitions for use on small jobs, such as additional signals where a side-track is lengthened.

Supply Trade News

H. Arnold Jackson, sales agent of the Bethlehem Steel Company, at Boston, has been elected president of the Chicago Pneumatic Tool Company, with office at Chicago, vice W. O. Duntley, resigned.

Major Warren R. Roberts, Quartermaster's Reserve Corps, president of the Roberts & Schaefer & Co., Chicago, has been promoted to lieutenant-colonel. At present he is an executive officer for the constructing branch of the construction division of the United States Army.

The Liberty Car & Equipment Company, 20 West Jackson boulevard, Chicago, has been incorporated with P. H. Joyce as president, and has bought the freight car plant of the Central Locomotive & Car Works, Chicago. The locomotive plant of the latter is being utilized for the manufacture of farm tractors.

M. F. Emrich, formerly of the Glidden Company, Cleveland, Ohio, has been appointed assistant general manager for Berry Brothers, Detroit, Mich. Mr. Emrich was with the Glidden Company for 28 years, having filled various positions, from the bottom up to the position of assistant to the president. He began his services with Berry Brothers on April 1.

Rufus Franklin Emery, secretary and treasurer of the Westinghouse Air Brake Company, died suddenly on April 11, in his office at Wilmerding, Pa. He was born in 1869 at



R. F. Emery

Chatham, Mass., and was educated in the grammar and high schools of his native town. He entered business life at an early age and after service with several business interests in the Pittsburgh district, entered the service of the Westinghouse Air Brake Company in September, 1892, where he held various positions of trust and responsibility, until 1909 when he was elected secretary and treasurer. At the time of his death, Mr. Emery was an officer and director in a number of business and financial institu-

tions in the Pittsburgh district.

The International Oxygen Company, 115 Broadway, New York, announces the appointment of A. E. Ward as sales manager. Mr. Ward was formerly associated with the Prest-O-Lite Company, and in the course of years of association with the compressed gas industries has gained recognition as an expert in the industrial applications of oxygen, hydrogen and acetylene.

George W. Bender, assistant to the vice-president of Mudge & Co., Chicago, has been appointed eastern manager of that company, with office at 30 Church street, New York; and Clyde P. Benning, assistant to the vice-president, has been appointed western manager, with office in the Crocker building, San Francisco, Cal., and will have charge of the business of Mudge & Co., in the Pacific Coast states.

F. E. Whitcomb, whose resignation as signal engineer of the Boston & Albany was announced last week, has become special representative of the Federal Signal Company, with headquarters at New York. Mr. Whitcomb has been in railroad service about 21 years, having entered the employ of the Boston & Albany as a lineman in October, 1898. In 1902 he was promoted to foreman and two years later was made electrical assistant to the signal engineer. In February, 1905, he was appointed division foreman of the signal department of the Al-

bany division, with headquarters at Springfield, Mass. In 1910 he was again promoted, becoming engineer of maintenance of signals, with office at Boston; and the following year was made signal engineer, which position he has just resigned.

No Supply Exhibit at Convention of Fuel Association

At a recent meeting of the International Railway Supply Men's Association at the Hotel Sherman, Chicago, resolutions were passed suspending dues for the year 1918. This action was taken following a request by the International Railway Fuel Association that no exhibit be held at the coming convention of that organization. All entertainment features by the supply association will also be dispensed with.

The Haskell & Barker Car Company

The financial statement of the Haskell & Barker Car Company, Michigan City, Ind., for the year ended January 31, 1918, made public at the annual meeting of the stockholders held in New York last week, shows net earnings nearly three times those of the previous year. The balance, after making deductions for repairs, renewals, etc., reached the figure of \$2,340,859, as compared with \$829,617 in the previous 12 months. Applied to each of the 220,000 shares of the company's stock outstanding, the net earnings were equal to \$10.64, as against \$3.77 a share for the preceding fiscal period. After deducting reserves for extraordinary replacements the surplus was equal to \$9.27 a share, as against \$3.15 for the preceding 12 months.

The income account and balance sheet as of January 31, 1918, with comparisons, follow:

| INCOME ACCOUNT | | |
|------------------------------|-------------|-------------|
| | 1918 | 1917 |
| Gross earnings | \$2,634,192 | \$1,135,366 |
| Repairs, renewals, etc. | 293,333 | 305,749 |
| Net earnings | 2,340,859 | 829,617 |
| Dividends | 660,000 | 165,000 |
| Balance | 1,680,859 | 664,617 |
| Reserve for renewals..... | 300,000 | 135,000 |
| Surplus | 1,380,859 | 529,617 |

| BALANCE SHEET | | |
|--|--------------|--------------|
| ASSETS | | |
| Cash | \$1,411,951 | \$680,885 |
| Accounts receivable | 1,538,118 | 2,054,175 |
| Employees' liberty loan subscriptions | 133,450 | |
| Securities owned | 984,815 | 45,578 |
| Inventories | 3,082,739 | 3,368,298 |
| Property and plant account..... | 5,121,121 | 5,067,045 |
| Totals | \$12,272,197 | \$11,215,983 |
| LIABILITIES | | |
| Capital stock | \$9,332,000 | \$9,332,000 |
| Audited vouchers, payrolls, taxes, etc. | 552,788 | 1,189,794 |
| Reserves | 476,932 | 164,572 |
| Surplus | 1,910,275 | 529,617 |
| Totals | \$12,272,197 | \$11,215,983 |

At the annual meeting of the stockholders, A. J. McAllister was elected to the vacancy in the board. The retiring directors were re-elected.

Trade Publications

SELF-OPENING DIES.—A booklet, entitled "Wells Self-Opening Dies," has been issued recently by the Greenfield Tap & Die Corporation, Greenfield, Mass. It contains a detailed description and illustration of the self-opening die manufactured by that company and shows the tool to be very serviceable and adaptable to widely varying conditions. The different kinds of tripping arrangements, including the pull trip, rim trip, face and lever trip are illustrated.

THE BAKER LOCOMOTIVE VALVE GEAR.—Under this title a book of pocket size, bound in stiff paper covers, has been published by the Pilliod Company, 30 Church street, New York. This publication is a treatise on the Baker locomotive valve gear, which is completely described and illustrated and for which a large amount of data is given in tabular form as to valve events, proportions of parts, etc. About one-half of the book is devoted to a description of the methods of setting the valves, each step in the explanation being accompanied with an example. Several pages are also devoted to the Sentinel low water alarm, which is manufactured by the Pilliod Company. For general distribution a price of 25 cents is quoted.

Financial and Construction

Railway Financial News

CHICAGO & NORTH WESTERN.—E. D. Hulbert, president of the Merchants Loan and Trust Company of Chicago, and Henry C. McEldowney have been elected to succeed Zenas Crane and James Stillman as directors. Marvin Hughitt has resigned as chairman of the board.

GEORGIA & FLORIDA.—John F. Lewis, president of the Citizens Bank of Valdosta, has been appointed as one of the receivers of this road, to succeed Harry R. Warfield of Baltimore, resigned. A few weeks ago Mr. Lewis, with his brother, E. B. Lewis of Montezuma, Ga., purchased the holdings of the Baltimore Trust Company in the Georgia & Florida.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—J. B. Morgan of Nashville has been elected a director to succeed J. H. Fall of New York, resigned.

NEW YORK CENTRAL.—The directors have declared the regular dividend of 1¾ per cent payable May 1 to stock of record April 13. A special meeting of stockholders will be held June 5 to authorize or ratify an agreement between the company and the United States Railroad Administration. Special meetings of the companies controlled by the New York Central will be held on or about May 22 for the same purpose.

NORTHERN PACIFIC.—Howard Elliott and George F. Slade have been elected directors to succeed, respectively, William S. Tod, resigned, and Grant B. Schley, deceased.

OREGON SHORT LINE.—At the annual meeting of this company old board of directors was re-elected with the exception of Marvin Hughitt, who was succeeded by his son Marvin Hughitt, Jr. At the organization meeting of the directors the election of W. A. Harriman to the executive committee was to fill the vacancy caused by the retirement of Marvin Hughitt.

Railway Construction

CANADIAN NORTHERN.—Contracts have been given by this company for building a steel bridge, with concrete piers and abutments, over the St. Maurice river at Grand Mere, Quebec, as follows: For the foundations, to Joseph Gasselin, Quebec; and for fabricating and erecting the steel, to the Dominion Bridge Company, Lachine. The cost of the improvements, including grading approaches, steel and masonry work, will be about \$170,000.

CHICAGO, BURLINGTON & QUINCY.—This company has awarded a contract for the construction of a freight house at Scott's Bluff, Neb., to Harvey Wood, Aurora, Neb. The building will be a wooden frame, brick structure, 40 ft. by 120 ft., with asbestos shingle roof.

CHICAGO & NORTH WESTERN.—The stockholders of this company have authorized the directors to appropriate \$1,500,000 for completing the construction of the Milwaukee Connecting Railway, comprising a belt line of 12 miles on the western and southern sections of Milwaukee.

KANAWHA & MICHIGAN.—This company has started work on the first section of a 15-mile double-tracking project between Charleston, W. Va., and Nitro. The first work consists of building 1½ miles of new line between Charleston and West Charleston, connecting with existing passing sidings. The work is being carried out by company forces and includes constructing a gauntlet over the Elk River bridge.

KANSAS CITY, MEXICO & ORIENT.—The Texas legislature recently passed a resolution asking the director general of railroads to authorize the extension of this line from San Angelo, Tex., to Del Rio on the Rio Grande border, a distance of about 155 miles. The resolution points out that the grading of the proposed line has been completed from San Angelo to a point 80 miles south and from Del Rio north 25 miles, leaving a gap of 50 miles yet to be graded.

Railway Officers

Executive, Financial, Legal and Accounting

E. M. Hyzer, vice-president and general counsel of the Chicago & North Western, with office at Chicago, has resigned.

The resignation of **Marvin Hughitt** as chairman of the board of directors of the Chicago & North Western is commented on elsewhere in this issue.

Operating

E. T. Campbell, general traffic manager of the Erie, with office at Chicago, has been appointed assistant general manager, with office at New York, and his former position has been abolished.

D. B. Fleming, superintendent of the Buffalo division of the New York Central, with office at Buffalo, N. Y., has been appointed superintendent of the Mohawk division, with headquarters at Albany, N. Y., succeeding **D. L. Sommerville**; **L. S. Emery**, superintendent of the St. Lawrence division, with office at Watertown, succeeds Mr. Fleming; **J. W. Evans**, superintendent of the Rochester division, with office at Rochester, succeeds Mr. Emery, and **D. L. Sommerville**, superintendent of the Mohawk division, with office at Albany, N. Y., succeeds Mr. Evans.

A. W. Brant, master of trains of the Louisville & Nashville, with office at Nashville, Tenn., has been appointed assistant superintendent of the Nashville division, with headquarters at Nashville; **J. P. Polk**, assistant master of trains, has been appointed master of trains, with office at Nashville, vice Mr. Brant; **B. F. Burrell** has been appointed assistant master of trains of the main stem second, Nashville & Decatur and Lewisburg divisions, vice Mr. Polk, and the territory of **T. C. Sullivan**, assistant master of trains, with office at Nashville, has been extended to the Nashville & Decatur and Lewisburg divisions.

Engineering and Rolling Stock

George A. Kirley, whose appointment as signal engineer of the Boston & Albany, with headquarters at Boston, Mass., has already been announced in these columns, was born on August 31, 1880, at Fairfield, Vt., and received his preparatory education at Brigham Academy, Bakersfield, Vt., following which he took a course in engineering at the University of Michigan, graduating in 1907. The same year he entered the service of the New York Central as a draftsman in the signal department at New York. In May, 1909, he went to the Boston & Albany, and since that time has been in the continuous service of the signal department of that road. He served consecutively as draftsman, as chief draftsman, and later as assistant engineer, until his recent appointment as signal engineer of the same road as above noted.



G. A. Kirley

Traffic

Charles B. Irwin, livestock agent of the Union Pacific with office at Omaha, Neb., has been appointed general agent, with headquarters at Cheyenne, Wyo.

G. H. Corse, Jr., resigned on April 1 as foreign passenger agent of the Union Pacific System to become traffic manager

for G. Amsinck & Co., Inc., New York City, and the office of foreign passenger agent of the Union Pacific has been abolished.

The title of **Archibald Fries**, assistant general freight traffic manager of the Baltimore & Ohio, with office at Baltimore, Md., has been changed to general freight traffic manager.

The duties of **C. A. Gormaly**, commercial agent of the Grand Trunk, with office at Chicago, and the duties of **H. W. Ploss**, commercial agent of the Grand Trunk, with office at Milwaukee, Wis., have been extended to include traffic, except bulk grain, via the Canada Atlantic Transit Company.

Lyman Sholes, division freight and passenger agent of the Chicago, St. Paul, Minneapolis & Omaha, at Omaha, Neb., resigned, effective April 15, on account of ill health, after 45 years of service with the North Western lines. The office of division freight and passenger agent at Omaha has been abolished. **Edgar A. Gray**, general agent at Helma, Mont., has been transferred to Omaha, effective April 16.

Special

W. J. Dudley, assistant superintendent of the relief department of the Baltimore & Ohio, with office at Baltimore, Md., has been promoted to superintendent of that department, succeeding the late **S. R. Barr**, and **W. M. Kennedy** has been appointed assistant superintendent of the same department.

Railway Officers in Government Service

George E. Tebbetts, bridge engineer of the Kansas City Terminal, Kansas City, Mo., has received a leave of absence to assume a civilian position with the Emergency Fleet Corporation, Washington, D. C.

Major F. E. Lamphere, Quartermaster's Reserve Corps, formerly assistant engineer of the Baltimore & Ohio Chicago Terminal, has been promoted to colonel. He is now stationed at Port Newark Terminal, Newark, N. J.

Obituary

Albert A. Burleigh, who was president of the Bangor & Aroostook previous to 1900, and then to January, 1907, served as vice-president of that road, died on April 8, at Houlton, Me., at the age of 77.

Frank L. Sheppard, resident assistant to vice-president in charge of operation, of the Pennsylvania Railroad, with headquarters at New York, died on April 13, at his home in New York. He was born in 1851 at Bridgeton, N. J., and entered the service of the Pennsylvania Railroad in 1868 as an apprentice at the Altoona (Pa.) shops. He subsequently served in various capacities until 1881, when he was appointed superintendent of the Sunbury division of the Philadelphia & Erie, and then was consecutively superintendent of motive power at Altoona, general superintendent of the Pennsylvania Railroad division, general superintendent of the United Railroads of New Jersey division, which was later changed to the New Jersey division and included the Pennsylvania tunnel and terminal line; also, as general superintendent of the West Jersey & Seashore. On May 1, 1916, he was appointed to the newly created position of assistant to vice-president in charge of operation.

CONTEMPLATED HIGHWAY DEVELOPMENT IN 1918.—Combined forces of the government, states and counties will spend for highway improvement in 1918 the amazing total of \$263,096,610. This is the announcement contained in the first detailed survey of the nation's road building plan issued by officials of the touring bureau of the B. F. Goodrich Rubber Company, who have been in contact daily for two months with highway commissioners of the states. While this sum seems staggering, eclipsing by eighty-two per cent the expenditures of any previous year and in money figures that of 1917 by \$118,797,750, road officials of the government and states said it represented merely a "drop in the bucket" of what should be spent before the war was concluded. Calculations by government officials are that with good highways, motor trucks and motor vehicles are capable of carrying approximately 200 per cent more freight than the railroads. In these same calculations they estimate the value of our highways at \$6,240,000,000.